1st Conference
of the International Academy of
Environmental Sciences

Ducal Palace, Venice
23-24-25 October 2003

INTERNATIONAL PROTECTION OF ECOSYSTEMS

"THE PLANET EARTH: KNOWING IT TO SAVE IT"
THE STUDY AND SAFEGUARDING OF ECOSYSTEMS

INDICE GENERALE

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Michl Ebner: Answers to the questions. III mpg 2:05:07/2:07:59
Giovanni Massagli: Presides over and moderates the course of the activities, and introduces Piva's paper. III mpg 2:08:00/2:08:10
Maria Giovanna Piva: The role of the 'Magistrato alle acque' of Venice in the safeguarding of the lagoon.
Preview of a film.

Ducal Palace: Piovego hall
Day two [24.10.2003]: beginning activities and opening Papers
[Morning]

ROUND TABLE

Giovanni Massagli and Giuseppe Zupo preside over and moderate the round table. The following journalists take part: IV mpg 0:00:00/0:00:09
KATHY SMITH [for many years a BBC and ITM journalist in the United Kingdom; today, a freelance journalist based in Brussels and focusing on the environment, and the author of the film realized for the European Environmental Commission] , 254 IV mpg 0:00:10/0:05:10

SERGIO FRIGO (Gazzettino) and
ANTONIO LOPEZ (Airone) 254 IV mpg 0:31:12/0:37:34

In the afternoon we shall engage with the theme of TECNOLOGIES AND ENVIRONMENTAL PROBLEMS, AND, CONSEQUENTLY, OF THE FORMS OF CONTROL AND OF THE STUDY OF ECOSYSTEMS, AND THE ROLE OF PUBLIC AND PRIVATE COMPANIES [PART 4 of the Conference]

Ennio Fortuna and Raffaele Raimondi : Moderators IV mpg 0:38:45/0:53:03
Speakers:
Pierfrancesco Ghetti: Environmental information. Biological damage indicators 257 IV mpg 0:53:12/1:05:57
Giovanni Mazzacurati ['Consorzio Venezia Nuova']: The public and private safeguarding of the lagoon ecosystem dell'ecosistema lagunare tra pubblico e privato 262 IV mpg 1:06:46/1:43:53
Paolo Cecamore ['Telespazio']: The control and study of ecosystems. The role of satellite control. 258 IV mpg 1:44:45/2:09:09
Giancarlo Ruscitti: Enterprise Digital Architects' means of telecommunication in the case of environmental emergencies. 260 IV mpg 2:09:42/2:22:41
A. Abrami IV mpg 2:22:45/2:23:33
Aldo Di Benedetto: The role of Environmentalist Organizations. 253 IV mpg 2:23:34/2:32:30

DEBATE

Arch. Foscari [who intervened in the debate] IV mpg 2:33:03/2:39:47
Dr. Rosaria Conte [who intervened in the debate] IV mpg 2:40:09/2:42:50
Dr. Giancarlo Ruscitti IV mpg 2:43:05/2:45:54
Antonino Abrami: Some conclusions following the first two days of work. IV mpg 2:46:00/2:53:16

DUCAL PALACE : SALA DEL PIOVEGO AND SALA DELLO SCRUTINIO

Day three [morning, 9.00/12.30, 25.10.2003] : WORKSHOPS
[SALA PIOVEVO]

1ST WORKSHOP : 'THE INTERDISCIPLINARY PROTECTION OF NATURE'
of the MARINE ECOSYSTEM;
of the MOUNTAIN ECOSYSTEM;
of the FLUVIAL ECOSYSTEM

2nd WORKSHOP : 'THE ENVIRONMENT AND HUMAN HEALTH'

3rd WORKSHOP : 'THE INTERDISCIPLINARY PROTECTION OF THE URBAN ECOSYSTEM'
WORKGROUP MODERATOR: GIUSEPPE ZUPO
Participants:
Giuseppe Berlato Sella [Mayor of Schio]; 284
Simona Isidori [Agenda XXI – Municipality of Sesto San Giovanni (Milan)]; 285
Marco Zecchinato [Town planner – environmental planning expert]; 285
Gianluigi Ceruti [Lawyer – Nature Conservation lecturer - Univ. of Camerino];
Benito Sasso [Mayor of the the Municipality of Valstagna-Vicenza];
Fernando Donà [professional person];
Fossua Bruzzo [citizen of Orgiano representing civic opposition to the railway link]

2nd WORKSHOP : "THE INTERDISCIPLINARY PROTECTION OF NATURE". "PROTECTION OF THE MARINE ECOSYSTEM AND THE FLUVIAL ECOSYSTEM" 267
WORKSHOP MODERATOR: MARCELO ENRIQUE CONTI
Workshop participants:
Philippe Bourdeau: The recent report by the European Environmental Agency: assessing progress and degradation in the marine ecosystem, and the value of environmentalist ethics 267
Giovanni Cecconi : Sedimentary regime and coastal protection; cfr DVD
Giampietro Mayerle : The sedimentary balance of the Venice lagoon; cfr DVD
Oscar Ravera: The causes of eutrophication and its cure; cfr DVD
Antonio Tamburrino : The Mediterranean Action Plan, its contributions and the ecosystemic vision of the Mediterranean.
A problem still open to debate...; cfr DVD
Giovanni Damiani: Problems related to running waters and areas of transition: the lack of research and of the knowledge on data about polluting cargoes from pigsties and other settlements.
The lack of monitoring. cfr DVD
- Pierfrancesco Ghetti: Which intervention models for the Lagoon?
The CULTURAL value to be respected through the re-establishment of sandbanks, the consolidation, nourishment and reconstruction of dunes. cfr DVD
M.E. Conti's exposition of the group's conclusions VI mpg 2::16:27/2:19:20

1st WORKSHOP : 'THE INTERDISCIPLINARY PROTECTION OF NATURE THE PROTECTION OF THE MOUNTAIN ECOSYSTEM';
WORKSHOP MODERATOR: MASSIMILIANO MARANGON
The issues which the participants discussed revolved around the following points:

1) coherence in respecting the already defined areas to be safeguarded, and promotion of the integral protection areas of forest ecosystems in mountainous areas; safeguarding the profound unity of the mountain ecosystem; a definition of the production activities which are compatible with the mountain environment, with the the exclusion of "extreme" ones, which are aggressive, given the loss of the aesthetic and cultural aspect of the mountainous ecosystem;
3) whether or not to favour any reconstruction of small rural estates in the alpine area;
4) infrastructure problems to be solved (viability, trains, parking lots), with the particular fragility of the mountain ecosystem in mind; whether or not to favour Apennine parks by promoting the recovery of coppice and degraded woodland through a reinforcement of forest trees, bearing all possible production activities outside the protected areas in mind;
6) with a European perspective in mind, the extension of safeguarding to Eastern Europe;
7) from the point of view of tourism, not to open areas destined to failure and environmental spoilage, without any stable economic return on the market, when perhaps these are partly or entirely marginal areas which cannot pool. An incentive to favour other, pastoral or sylvan inclinations.

Those taking part in the workshop:
- Giacomelli: An experienced Public Prosecutor for piedmont areas in Vicenza
- Frando Pedrotti : proposal of a model for mountains, to be extended to all mountains of temperate Europa: the Alps, the northern Appennine, the Pyrenees, the Caucasus, etc.,
- Renato Andriolo: the importance of the farmstead ['maso chiuso'] and of local traditions for the protection of the mountain environment and of the economy of Alto Adige;
- Markus Feichter: the importance of the farmstead and of local traditions for the protection of the mountain environment and of the economy of Alto Adige;
- Gianluigi Ceruti: the farmstead as a factor of stability and of social continuity…

Franco Pedrotti's exposition of the group's conclusions VI mpg 2::20:12/2:24:23

2nd WORKSHOP: 'THE ENVIRONMENT AND HUMAN HEALTH
Saturday 25th of October - 9.00 am to 12.30 pm.
Workshop moderator: Giuseppe Cartei
Rapporteur: Klaus-Rudiger Trott

Those taking part in the workshop:
09.00 am – Giuseppe Cartei: Introduction. 268 V mpg 0:00:00/0:04:37
09.15 am – Giorgio Palù, Man in the environment of viruses: benign or malign illnesses. 269 V mpg 0:05:00/0:28:30

Discussion among those taking part in the workshop, followed by some conclusions.

12.00 am – Open discussion with the participation of:

Severino Benettelli: VAS ('Verde, Ambiente, Società' [Green, Environment, Society]) journalist

Giancarlo Ruscitti: Manager of Enterprise

Kathy Smith: European Journal Reporter

3rd WORKSHOP: 'THE INTERDISCIPLINARY PROTECTION OF THE URBAN ECOSYSTEM'
WORKSHOP MODERATOR: GIUSEPPE ZUPO

Participants:
Giuseppe Berlato Sella [Mayor of Schio];
Simona Isidori [Agenda XXI – Municipality of Sesto San Giovanni (Milan)];
Marco Zecchinato [Town planner – environmental planning expert];
Gianluigi Ceruti [Lawyer – Nature Conservation lecturer - Univ. of Camerino];
Benito Sasso [Mayor of the the Municipality of Valstagna-Vicenza];
Fernando Donà [professional man];
Fossua Bruzzo [citizen of Orgiano representing civic opposition to the railway link]

ATTACHMENTS

N.B. The entire press review will be broadcast in January and will include not only the various articles published on the local and national press, but also an important paper on the Academy and the Conference published on the first January issue of the well-known and much appreciated cultural and environmentalist monthly publication "AIRONE".

The statement ['Documents concerning the expenses met', in accordance with Resolution n. 2482 of the Veneto Regional Council, dated to the 8th of February 2003] signed and certified by the Treasurer of the Academy and auditor Dr. Giuseppe Arras.

1st CONFERENCE
OF THE INTERNATIONAL ACADEMY OF ENVIRONMENTAL SCIENCES
Venice – Ducal Palace 23-25 October 2003

SCIENTIFIC PAPER

From the 23rd to the 25th of October, the first Conference of the INTERNATIONAL ACADEMY OF ENVIRONMENTAL SCIENCES took place in the Ducal Palace of Venice. It brought together political spokesmen – among them, Hon. Prof. Rocco Buttiglione, Minister of Community Policies, the Mayor of Venice Prof. Paolo Costa, and Hon. Gerardo Bianco – with representatives of the academic and scientific world, of the media, press and civil society.

The contents of the program cought the interest of magistrates, lawyers, researchers and journalists, who, together with many undergraduate and graduate students (cf. with the list of participants and the certificates of attendance) turned to the Organizational Secretary to ask for information pertaining to the modes of participation to the event. Its program, along with the registration forms for booking one's attendance to the Conference and various other pieces of information on the structure and goals of the Academy, was, and still is, available online (http://www.environmentscienceacademy.com; cf. with http://www.environmentscienceacademy.com/test).

Right from the start, the presence of Prof. Adolfo Perez Esquivel, winner of the Noble Prize for Peace and President of the Academy, with his speeches, had a positive impact on the atmosphere of the Conference and of its work.

His humanitarian outlook and the now planetary dimension of environmental problems, as well as the need to avoid further attacks against the resources of 'MOTHER EARTH', provided guiding lines for numerous interventions, and thus the central issues for the formulation of the principles of the International Charter for the Study and Protection of Ecosystems.
The Acting President of the Academy, Prof. Antonino Abrami, who planned and coordinated all phases of the preparation and implementation of the activities, took part in several debates, presented the conclusions and contributed to the formulation of the Charter's text, which he put to the attention of the participants assembled at the end of the conference for a plenum.

A particularly important role was played by the moderators, who underlined the synergies and complementarities of the speeches, and drew the participant's attention to the most significant aspects.
Among them, it is worth mentioning Hon. Gerardo Bianco, who underlined the responsibilities held by political institutions, and Prof. Francesco Cartei, who emphasised the links between the environment and human health.

The programme was implemented in accordance with the expected plan, with the exception of a few changes caused by unforeseen circumstances. When such circumstances occurred, appropriate solutions were applied, which not only allowed the completion of the discussion on given subjects, but contributed to increase the public's interest. This has been the case with Prof. Horst Fischer's intervention on the subject of the international safeguarding of human and environmental rights, which was anticipated to the morning of the 23rd of October, and provided the participants with an

international picture of the situation by drawing a link with Prof. Domingo Docampo's paper on marine disasters caused by hydrocarbons.

This was also the case with the round table discussion which took place on the morning of the 24th, and was attended by Sergio Frigo, Gazzettino journalist, Kathy Smith[1] [European Journal reporter and for many years a BBC and ITM journalist in the UK] and Antonio Lopez , Airone journalist. The cultural level of those who took part in the round table discussion, and thethe public's interest and engagement with the second debate are the clearest markers of this success (cf. with the transcription of the papers and with the DVD recording of all activities).

Among the chief goals of the conference, was the definition of short and middle-term priorities, to be included in the program of activities of the Academy. (MORE ON THIS BELOW)

Goals and priorities will be discussed below. It is worth noting, however, that the program will deal with
professional training, particularly in relation to local and regional administrations and schools, with the development of international exchanges of working experiences with other public and/or private institutions;
b) the promotion of ties to NGOs.

An INTERNATIONAL CHARTER FOR THE STUDY AND PROTECTION OF ECOSYSTEMS has been published on the Academy's website [http://www.environmentscienceacademy.com].
A proposal has also been drafted for the support and development of synergies between art, culture and the environment, as a means to make the general public, and younger generations in particular, aware.

Sponsors and supporters were a central element in the implementation and positive outcome of the conference.
Support from the Veneto Region, the City of Venice, the 'Venezia Nuova' consortium, 'Enterprise Digital Architects', 'Telespazio' and ACTV was essential, not only financially, but also as a token of trust and esteem.
Such trust and esteem provided the Academy with the necessary encouragement to overcome significant obstacles and difficulties during the Conference.

It is worth noting the very nature of these sponsors: institutional and public on the one hand, private and commercial on the other; the fact that both decided to contribute to this initiative of the Academy can be seen as the first sign of everyone's involvement in respecting and protecting the environment.

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[1] *L'Accademia è particolarmente grata alla sensibilità e professionalità di Kathy Smith che ha accettato di partecipare alla tavola rotonda ancorché la stessa sia stata avvista del fatto solo poco tempo prima del fatto.*
Infatti solo poco prima è stata comunicata all'Accademia la mancata partecipazione del giornalista Xavier – Vidal-Folch Balanzo

Ducal Palace, Sala del Piovevo
[23 October 2003]
Part 1: Introducing the thematic workshops on the
PROTECTION OF MARINE AND URBAN ECOSYSTEMS
Chairman: Gerardo Bianco

1st Paper.
MARINE DISASTERS CAUSED BY HYDROCARBONS
[speaker: Domingo Docampo][2]

Rector Docampo stressed the need to 'change transport policies…in such a way as to avoid this kind of risks, since the EU must establish a network of infrastructures with the resources required... to deal with an accident of this kind'; on the other hand, Prof. Docampo shed light on the issue of 'responsibility related... to the transportation of dangerous cargoes", while emphasizing the central role the International Court of Justice, which is 'already extremely busy in the field', might play in improving the safety of transport.
Prof. Docampo provided valuable data on the effects of pollutants, data which requires no further comment:
Prof. Docampo pointed out that:
'900 kilometers of coastline were polluted, causing a huge amount of damage, exceeding 1000 million Euros. The disaster involved not only a vast area of Galicia, but also, to a lesser extent, other coastlines in Spain and France, Portugal and Great Britain, which suffered from the spilling of oil. As always, this new accident was a cause of environmental destruction and financial loss...".

Prof. Docampo ended his speech by praising and wishing the Academy well:

'This is the reason why we ought to work together to understand these problems and to protect the environment and ecosystems, in a compliant and realistic manner. While such knowledge is not an easy thing to achieve, for the Government's priorities can clash with these choices, we can all learn from the past in such a way as to avoid repeating the same actions, and reach the consensus surrounding the economic, environmental and political issues which is required to avoid the spilling of oil. With such an awareness in mind, I would like to congratulate myself with the Academy for having organized such an important meeting, which will shed light on the problem we are dealing with".

GERARDO BIANCO

Gerardo Bianco expressed his appreciation for Prof. Docampo's paper with explicit and vehement words. As a member of Parliament, Dr. Bianco, following Prof. Docampo, discussed the 'need for united policies' in the European Union, which is meant to be a political Union and not just a sum of States. He underlined Prof. Docampo's 'limpid exposition' of the problem, which not only conjured up 'dramatic images', but also, and most importantly, shed light on the correct measures to be taken in order to resolve such problem.

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[2] *Rector of the University of Vigo*

2nd Paper.
SAFEGUARDING HUMAN RIGHTS AND THE RIGHTS OF THE ENVIRONMENT
[Speaker: Horst Fischer][3]

After Rector Docampo, Prof. Horst Fischer, President of the inter-university centre EIUC, intervened. Prof. Fischer complimented himself with the Academy and said he was confident cultural links between EIUC and the International Academy of Environmental Sciences would be established in the future.

Prof. Fischer pointed out that his certainty derives not only from personal contacts of his – Prof. Abrami and Dr. Napoli – but also from the fact that the environmental themes will complete the scientific program of his Centre, which doesn't, at the present time, deal with such issues.[4]

In relation to the content of his paper, it is worth noting how Prof. Fischer shed light on certain legislative gaps the Academy might want to contribute to fill.[5]
Prof. Fischer's speech revolved around two main points:
General observations about human rights and the rights of the environment, along with a proposal for the filling of certain serious gaps found in laws dealing with environmental protection.
An examination of the existing legislature, with special reference to three actual cases.

When dealing with the first point [his observations about human rights and the rights of the environment, and his proposal for the filling of certain legislative gaps] the renown scholar emphasized:
a/1) Historical and prescriptive data.
a/1/1) HUMAN RIGHTS AND THE ENVIRONMENT: THE DIFFERENT CHRONOLOGICAL SUCCESSION AND THE PRESENT COMPLEMENTARITY OF THE TWO RIGHTS

Prof. Fischer mentioned how all multilateral agreements after Rio and Stockholm took environmental issues into account, while the most important documents regarding civil and political rights had already been formalized at an earlier stage, without dealing with the environment and the issues surrounding it.

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[3] *President of the inter-university Centre EIUC for human rights and democracy.*

[4] *Fischer stated: 'We are most pleased by the establishment of this Academy, which was officially inaugurated with this Conference. We are confident that the European centre EIUC will find a new friend and supporter in the Academy. I would also like to emphasize the fact that this will provide an important contribution to our institute's program, for if we compare it to yours, we can notice how we are lacking this aspect, this part dealing with environmental protection to complete the puzzle of our work. We are most pleased, then, that the Academy has been established right here in Venice.'*

[5] ***Fischer stated:***
'In the 20 minutes available, I would first like to carry out some general observations on human rights and the rights of the environment. Secondly, I would like to explain the existing legislature, by referring to three actual cases. Towards the end, I would like to discuss certain thing I find lacking, and which the Academy might want to deal with in the future with the workshop, in relation not only to Prof. Abrami's idea about the environment and the law, but to the environment and human rights. This is the outline of my speech.'

From the Stockholm Conference to 1994, when a fundamental link between human rights and the rights of the environment was established,[6] up to the 2002 Commission and Johannesburg, 'over the years, the International Community attempted to combine human rights with the rights of the environment.'
Prof. Fischer pointed out that 'from this point of view, one must note the dramatic events we have witnessed in the past 30 years and the steps which have been taken, starting from the declaration of Rio and the environmental debate at Stockholm.'
Prof. Fischer mentioned the fact that dealing with human rights after the Johannesburg summit on world development requires an approach to the issue of sustainable development to which they are linked.
According to Prof. Fischer, a further argument for linking the protection of human rights to that of the environment is provided by the fact that development might not actually take the form of healthy sustainable development.

a/1/2) HUMAN RIGHTS AND THE ENVIRONMENT AND THE EXISTANCE OF ONLY TWO MULTILATERAL AGREEMENTS WHICH REFER TO A HEALTHY ENVIRONMENT: THE 1991 CHARTER ON HUMAN AND PEOPLES' RIGHTS AND THE 1998 AMERICAN HUMAN RIGHTS CONVENTION PROTOCOL
These are two non-European and non-global documents, regional documents which explicitly refer to the right to live in a healthy environment.

Prof. Fischer mentioned how neither the scientific nor the legislative and cultural world has particularly appreciated these two Proceedings, for they don't seem to explain 'how' these rights can be enforced.[7] Nonetheless, the two documents are of crucial importance, for they 'are the only multilateral agreements which refer' to a healthy environment

Other multilateral documents implicitly refer to other rights and mention environmental protection or the effect of the environment on the individual. The first thing I would like to mention is the 1996 international agreement on cultural and social rights, which guarantees the right to healthy working conditions and the right of children, and more generally of young people, not to be exposed to hazardous work. Interestingly enough, since these documents were drafted in 1996, they never directly refer to the environment or to the effect of the environment, but only indirectly. This is the way in which such multilateral agreements deal with environmental issues.

Multilateral agreements of a more general, or more specific nature, which deal with specific issues, do exist, but they never openly mention the rights of the environment. A 1998 agreement exists, which concerns children. It is another multilateral document which refers to the child's right to good health, and to the influence of the environment on health.

One more thing is worth mentioning here: a 1998 convention of the International Work Organization, which refers to indigenous tribal populations. The convention deals with the earth

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[6] *'The results of this report are available, and are worth reading after all these years. The report deals with the bases of human rights and environmental protection.'*
[7] *According to Prof. Fischer it provides no 'guidelines for the actual enforcement of these rights'.*

and its resources, the environment in which the indigenous tribes live, and with the protection of such tribes. One can see how this convention is of great importance for its discussion of the rights of certain groups in particularly vulnerable societies, dwelling in an extremely specific environment.
One can see, if he examines the activities of the American Human Rights Court, that the protection of indigenous groups plays an important role in the debate surrounding human rights and the rights of the environment. What I am keen to point out, is, on the one hand, the existence of many multilateral treatises which establish specific rights connected to the environment; on the other, the absence of any clear and explicit reference to the right to a healthy environment.

a/2) Environmental protection and citizens' right to information/participation.
Prof. Fischer discussed the importance of the Haarus Convention, which was adopted in 1998. Unfortunately, many States did not approve such Convention, which deals with public participation and access to information and law.
Prof. Fischer emphasized the importance of the Convention, which allows 'the individual to take part in the decision-making process and to have access to law.'

a/3) Here a reference is made to the Convention on the struggle against desertification in those countries suffering from aridity, which 'anticipated the Haarus convention.'
a/4) The Conventions and the implementation of their principles, discussed at the light of two cases examined by the European Court for Human Rights.
The Conventions and the enforcement of their principles by means of a discussion of two cases examined by the European Court for Human Rights.
Prof. Fischer declared:
'I would like to mention two specific cases which have proved of great importance for our understanding of how these conventions can be applied or have been applied by the Courts.
I would like to start by mentioning a case discussed by the European Court for Human Rights. I chose it not only because it is an Italian case, but also because it is one of the cases, one of the causes, which the European Court for human rights used in its study of the European aspects of the issue of human rights and the rights of the environment. I am talking about the Gherra case, which deals with the effects of the toxic waste produced by a certain Italian industry on the environment. Given the absence of specific legislature, the Court was forced to refer to other rights, and other laws. What is most interesting is the fact that the fundamental rights which the court took into account were the right to information (Clause 10) and the right of an individual not to have his house violated (Clause 8). The Court made use of both clauses as a means to pronounce judgment, having observed that the Italian company had breached both. I would also refer here to the Seveso case. One can then observe a mixture of fundamental human rights and rights of the environment, which the Court referred to.
Another case I would like to mention comes from Latin America. The case was discussed by the Inter-American Court for Human Rights; it involves an indigenous group from Nicaragua which was threatened by the establishment of an industry on their land. The case is commonly referred to as the Maiana Case. The Inter-American Court examined the effect of certain initiatives on human health, taking also conventions dealing with the protection of indigenous peoples into account. The Court ruled that a violation of human rights had taken place, this time in Latin America. If we examine the record of cases involving International Courts, we can find hundreds of sentences involving human rights, but hardly any specifically referring to the environment.

Another interesting case involves Turkey: the 2002 Ineildis against Turkey. A family stated that the State, the Turkish State, was not taking the necessary steps to protect families against toxic waste. In 2002 the European Court made use of Clause 8 of the convention to declare that a violation of this right had taken place. If you consider what has been said so far, you will soon realize the impossibility of presenting an international legislature straightforwardly dealing with human rights and the rights of the environment, since the picture is a rather multifaceted one: we have a number of laws and International Court resolutions, but many gaps, even in the most recent literature on the subject, which I have been able to observe before coming here. The whole picture would be worth the Academy's attention, particularly because it has the advantage of being a multi-disciplinary Academy; in other words, it is composed of experts in different fields. Only in this way will it be possible to examine the legislature to see whether it is acceptable, open to further developments, etc. If one were to ask whether the right to a healthy environment is guaranteed, he would soon realize that many people lack the multi-disciplinary preparation necessary to provide a clear answer to the question. For this reason, I am glad to take part in the Academy's work. I would now like to emphasize the chief gaps worth discussing. The first is the issue of procedure applications at an inter-State level. States are unwilling to accept the laws' procedure applications for the simple reason that no one is willing to undergo controls and to be summoned before an international forum where it will be told it has made many mistakes by not applying this or that. This is no doubt one of the chief problems which ought to be discussed. As I have previously mentioned, Harus has taken a first step in this direction, although the number of ratifications is very limited. First, then, we should ratify this convention and enforce its procedures. A second problem is represented by global contamination, so to speak: even in terms of the right to information and to the access of law, we are mostly dealing with local problems. If something happens in Germany, for instance, one can refer to German laws; if something happens in Italy, to Italian laws, and so on. As for one of the Italian cases I mentioned, it took ten years to pass from a national level to the International European Court. In my opinion, this ten-year wait is utterly unacceptable, particularly for the individuals and families involved.'

Prof. Fischer addressed the Acting President of the Academy, Prof. Antonino Abrami, and declared he was willing to accept the project Prof. Abrami had long supported,[8] which he labelled an 'extremely interesting and valid' proposal, requiring the study of penal aspects.[9]

GERARDO BIANCO

When thanking Prof. Fischer for his 'splendid... paper', Gerardo Bianco stressed how he had addressed a number of significant problems and brought to light 'the need to turn the issue of environmental rights into an issue about the democratic involvement of citizens.'
Dr. Bianco then mentioned how the political milieus ought to confide in the scientific community for a definition of tolerable thresholds for various forms of pollution. Such thresholds are usually defined by politicians on the basis of decisions of a scientific character, since science does not always stand united on the matter.

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[8] *Cf. with Abrami's contribution on 'The International Court of Justice for the Environment.'*

[9] *' **As for the Court of Justice,** Antonio, it is an extremely interesting and valid proposal. However, we ought to examine not only the penal aspects, but also the ones dealing with issues of protection, for the Court of Justice aims at establishing penalties, but what interests me, is the issue of protection.'*

Dr. Bianco underlined the importance of certain issues discussed by Prof. Fischer, desertification and the need to ratify several conventions among them. He also stressed the fact, that in relation to our need to ratify such conventions, Prof. Fischer's proposal to collaborate, in the name of the many European universities he represents, with the Academy, constitutes a valuable proposal for a future multi-annual working project.[10]

3rd Paper
SCIENCE AND RIGHTS. VENICE: A LABORATORY FOR WORLD POLLUTION
[Speaker: Felice Casson]

According to Dr. Casson, the case of Venice and of its most delicate ecosystem raises many issues. Since the 1960s, Venice represents an environmental testing ground for national politics and legislation.
In the words of the speaker:

'I recall how the environmental issue had been completely left out of our 1947 Constitutional Charter. However, we can mention some previous laws, drafted in the 1930s, which are still valid, for the protection of the lagoon and of the fishing activities taking place in the lagoon, from the risk of industrial pollution. We had to wait until the 1960s for the enactment of special laws for the protection of Venice, of its lagoon and of its waters from all forms of pollution, which carried almost ridiculous penalties. Nonetheless, for many years a reckless industrial policy managed to tread on every aspect of human and environmental protection, thanks to the direct or indirect complicity of public institutions and control organs, which, until recent years, avoided doing their job.
The gradually worsening situation is clearly visible. The many enquiries conducted in the past years opened a kind of Pandora's box in many aspects of Venetian life. The case of Porto Marghera is only the largest and most well known. We have merely dealt here with one aspect of industrial production, that of chlorine, which is certainly not the only one. Let us just consider the severe pollution caused by the production of glass and the spilling of arsenic in the Venice lagoon. In order to provide a simple and quick means of understanding the problem, I will limit myself to presenting a few of the data collected by the Judicial Police, the State Forest Patrol, the Financial Police and, in recent years, by public institutions such as the Province and Municipality of Venice. I will not comment upon them because I am pressed for time, but they will be screened at my back to give an idea of the figures involved and of the seriousness of the pollution.[11]
On with my paper, then. It is clear that the case of Marghera entails a multifaceted judicial problem. Firstly, it is a problem of social justice, for the harm caused to people and the environment by what

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[10] ***Bianco, when referring to Fischer's idea of the Convention on desertification as something 'very far away', stressed its closeness*** *['Allow me to say that for us – I come from Southern Italy – it is something very familiar indeed, for we are already suffering from phenomena of desertification, which are taking place right now. Yours was an important analysis of the situation, which has bound politicians to carry out ratifications. It also placed a great responsibility on the Academy, Nino, something, we might say, it will take at least 20 years to work on.']*

[11] ***In order to fully profit from the 'reading' of the Paper, as in the case of all other papers, one might consult the media-player DVD audio and video recording of all the activities of the conference (23-25 October 2003).***

often appears to be a criminal industrial administration are still there, demanding some kind of reparation. One must admit that in the past few years an environmental sensitivity spread among both the political class and population at large, but it is still lacking among all areas of public institutions responsible for controls, and less still among industrialists, who have only proved capable of using many pleasing but empty words for their own profit. Having polluted and profited for years, they are now expecting to decontaminate the area and to continue profiting for who knows how many decades still, while exploiting the weak spot of the situation: workplaces. In doing so, they continue to put into practice the lessons learned during the darkest and most obscurantist period of industrialism: the threat of unemployment. This is recent history- contemporary news, I would say. What is worst, we cannot see who would be capable of providing a resolute opposition.
Another case of denied justice is that of the endurance of hazardous industrial activities in delicate areas. We all remember the TV broadcast of the most recent accident at the TDI of Marghera on the 28th of November 2002, with the mayor of Venice, wearing one of those gasmasks the Germans call 'run away!'. We all remember the huge risk run by the population of Marghera, Venice and Mestre, had a second fortuitous explosion not extinguished the first fire, in such a way as to keep it from reaching the phosgene pipelines nearby (a few dozen meters). Had this occurred, we would have witnessed a new Bophal.
Over the past few years dozens of escapes of toxic and carcinogenic substances have occurred in various Porto Marghera industrial plants. We are continually staging new court trials, which I will avoid listing, given I am pressed for time. What are we to do, then? Once again, the threat of unemployment is strong, and politicians are unable of extricating themselves from it. Any sort of public, long to medium term planning is lacking, despite the European Community's pioneering guidelines and pressure. It is as if many politicians were thinking at the most in terms of the completion of their electoral mandate, unable to look beyond their own noses. We are often told that Italy lacks an industrial policy: I would like to answer that the only reason no such policy exists is that politics are governed by industrialists.
Yet another aspect of denied justice is that of the difficulty of obtaining justice in a courtroom. Fortunately enough, this is not always the case. It is certainly true, as we all know, that the major court case to have taken place in the past few years in Venice, the one know as the Petrolchimico case, ended with various forms of acquittal, ranging from its falling into prescription, to illegality not being proven. One should always bear in mind that a grievous series of accidents, such as the escape of toxic and carcinogenic gases, led to the conviction of the defendants and their imprisonment, and to the payment of large sums for compensation at the hands of the companies found responsible. Many other cases are being discussed at the present moment, for instance those dealing with the protection of workers and of the environment from asbestos exposure.
The fact is, that at the present moment the concept of the environment and its close connection to man ought to have reached our consciences. Water, earth and air cannot travel separately. Nevertheless, were one to search for the causes leading to the degradation and injury of man and the environment more thoroughly, he would encounter significant difficulties.'

Here the speaker referred to the issue of the establishment of the International Court of Justice for the Environment:
'The issue of the establishment of an International Court of Justice for the Environment has already been previously proposed, and will be discussed again in the course of this meeting. It is no doubt an important proposal, and I believe we ought to be clear about it. Any national or international appeal made to a Judge recognizes, by its very definition, the fact that a pathological situation

already occurred; on the contrary, in this field, as in any other field of contemporary life (organized crime, terrorism, corruption, public administration abuse), preference must be given to systems of prevention. As others will discuss the matter, I will not dwell on it. I would only like to emphasize the fact that the solution of environmental, national and international problems cannot pass through any courtrooms, for this is not the purpose of criminal courts. Having said that, and to get back to the issue of the difficulties all inquiries dealing with environmental crimes meet, I would first of all like to point out that my impression is that such difficulties and problems are shared by the enquiries of both the national authorities and of an International Court for the Environment to be established.'

Dr. Casson now discussed the case of Marghera:

'Clearly, what we are dealing with here are extremely complex investigations, requiring a number of different sciences which a jurist is usually not familiar with. Let us consider, for instance, the scientific knowledge necessary to the understanding of the Porto Marghera events, ranging from medical sciences, if it is appropriate to use the term 'sciences' in the case of medicine, to legal-medicine, genetics, molecular biology – we have contacted many experts in the fields of oncology, pneumology, the emolinphatic system, hepathology, the encephalous, etc. – to chemical, industrial, biological and plant engineering. The first problem which ought to be solved is that of the training of staff capable of carrying out environmental investigations, such as the judicial Police, control organs, and the enquiring and judicial Magistracy.
I consider this the first problem, given the fact that in any case it consists in the acquisition of the necessary knowledge, which is a universal problem which cannot be left aside. It is not easy to solve, for at the present moment such knowledge would be almost encyclopaedic and not limited to the experts I have mentioned. This issue is of primary interest for enquirers and controllers. It also involves judges, since it is unacceptable for self-styled experts to lead judges by the nose in courts, as was the case, for instance, in a recent case in which theses such as the 'ormesi' theory, which no researcher, no scientist would dare to mention at a scientific meeting or convention, were proposed. Yet, they continue to do so in courtrooms.
What has been said so far leads me to a discussion of another important matter, the issue of scientist and researchers, usually referred to as experts and advisors, in court cases. Fact is, enquirers are forced to turn to such experts, which can only be trusted if they are reliable and independent. What experience, and not the case of Venice alone, teaches us instead, is that the power, and the economic power in particular, of industries is by far superior to that of any other control organ or enquiry. All interventions carried out by big industries to conceal data, deceive public authorities, bewitch consumers and their organizations, are now part of the national and international literature on the subject. Pacts of secrecy have often been mentioned. Cases involving the production of carcinogenic substances such as monomerous vinyl chloride or asbestos or cigarettes or dioxins are standard examples, to quote an expression used in the United States, of illegal conspiracies at the hands of industrial companies.
What can we to do, then? How can we oppose the huge power of money? Once again, the establishment of serious groups of qualified and, more importantly, independent researchers and scientists is required. It goes without saying, that industries will always possess lager sums of money than courts and judicial organs. The difficulties met by the judicial system in Italy for the lack of funding were discussed in these very days. Such difficulties are not casual ones, and are destined to lead to

ever-greater problems in the field. For this reason, the need to deal with the economic issue, and to reaffirm a series of values not to be forgotten, such as intellectual and professional honesty and independence, should be evident. These values are indeed the values which should also characterize the training and activities of enquiring and judicial Magistrates. One cannot expect to find justice where independence is lacking, even in the case of the selection and appointment of judges and attorneys. For how can one be sure of their independence or correctness, if their are appointed by one State instead of another, or by one group instead of another, to deal with a certain case.
One last issue I would like to deal with involves the relation between science, including environmental science, and rights. Since the eighteen hundreds at least, science, beginning with mathematics and physics, realized the impossibility of freeing science from uncertainty. For centuries, scientists have pointed out that there is no such thing as scientific certainty; this very year, 2003, the same was clearly stated by the Italian Supreme Court.
No doubt, at least three kinds of uncertainty exist: inexactness, which is the most simple and perhaps the most easily solved; reliability, that is to say: the degree of reliance we can attribute to quantitative values; ignorance of complex procedures, as in the case of the laws of physics, which were considered to be almost uniform in a certain age.
What is the point, then, of following the myth of scientific certainty? And why should we base a court resolution on technical and scientific matters, such as environmental issues, on a kind of science which can no longer, by definition, be certain? The goals and methods of science on the one hand, and of the judicial process on the other, are clearly different. It is equally obvious that the two meet in certain occasions, when they are bound to interact and the line between the two is blurred. How are we to act in practice, then? Are we to give up the verification of a fact in the courtroom? Or are we to demand absolute scientific certainty? And can we, when multiple causes have been determined, meet satisfying, acceptable criteria? I believe the verdict pronounced by the Supreme Court I recently mentioned provided an important answer. As the verdict suggest, the preliminary step to be taken is to acquire knowledge of the facts. If one skips this passage, any other argument, and consequently any other decision, is distorted. To take an actual example into consideration, this is what the Court did, in my opinion, in the Petrolchimico case: it avoided dealing with many facts which emerged and avoided taking many existing clauses into account. Clearly, the rest of the argument was distorted, since it rested on different grounds. Once this fundamental criteria is met, we can see how the law tried to solve the problem. Here I will briefly sum up the Supreme Court's reasoning. The criminal proceedings, which is an essential passage in the gathering of information related to a crime, was supported by probatory arguments. These ought to start from the actual fact; the informative and justifying data of the conclusion are not entirely included in the preliminary remarks, as they depend on further elements of knowledge outside the preliminary remarks.

The same model, based on scientific laws, cannot, on the other hand, deductively explain causality. It is impossible for a judge to know all the causal antecedents and all pertaining laws: he can only refer, in the minor introduction to the argument, to a series of tacit assumptions, and consider present specific initial and surrounding conditions which are not recognized. According to the court, since the judge cannot know all intermediate phases which determined the effects of the case, or proceed to formulate an explanation based on a continuous series of events, the only well-founded reconstructive hypothesis the judge can accept is the one based on the link between human behaviour and the specific event, provided he adds a number of specifications, and the intervention of a different causal course can be reasonably excluded. Should the pre-eminently inductive nature of judicial control be rejected, while nevertheless requiring a causal explanation of a deterministic

kind, by following criteria of utopian absolute certainty, the preventive and repressive aims of the law and the penal process in crucial areas for the protection of primary goods, such as the environment and the health of individuals, and of workers in particular, would be thwarted. Bear in mind, that this concept of utopian absolute certainty has been detailed and confirmed by the Supreme Court. What this means, is that the Judge is involved in a hermeneutical operation according to the common standards of trial certainty, which lead to the judiciary passing a verdict of responsibility, even in terms of likely logical probability or of probability approximating certainty. Moreover, the court claims that it is unacceptable to consider only the universal scientific laws and the statistic laws with a coefficient of probability which approximates 1, i.e. certainty, as a means of explanation The expression I previously used, the likely probability or rational credibility of the judge's assessment, refers to the examination of that link in relation to the available evidence and the circumstances of the actual case. What is the role of the law in this area and of the judge in the process of acquiring knowledge? It is to establish whether the postulated connection, which provides the basis for the judge's free convincement, without limiting the examination of the phenomenon to itself, is actually relevant, and whether it ought to be considered rationally credible, in such a way as to attain trial certainty.

When one claims, in the case of certain verdicts, that scientific uncertainty must be proven beyond any doubt, he acts against this kind of juridical foundation, by stopping at an earlier stage, which strips the argument of the rigorous nature it wanted to confer, and is incapable of reaching the decisive conclusion the Supreme Court recommended. For this reason, what ought to be proven beyond any reasonable doubt is the uncertainty of the probative examination.

Casson ended his speech by referring to the links between science and law, and their place within a penal court case:
'I will again state that the definition of the concept of a criminally relevant cause is significantly connected to the assessment of the trial, which constitutes a decisive factor in the definition of the cause in relation to the single event, particularly so where complex phenomena of multiple causation are present, as I previously mentioned when I was discussing the presence of several causes, particularly in matters as complex as environmental issues. This multiple causation and these phenomena of multiple causation are linked to the modern development of activities, and of industrial activities in particular. This is the scientific method the Supreme Court refer to, and a method we hope will be followed by the judicial bodies as well, in order to reach a declaratory judgment beyond any reasonable doubt'.

IN MEMORY OF ALFREDO BRAVO, WITH AN INTRODUCTION BY ADOLFO PEREZ ESQUIVEL

[Antonino Abrami]

I would like to thank Adolfo Perez Esquivel for joining us. We all know what a busy man he is, and that Argentina is not exactly around the corner. Adolfo wanted to join us, and we thank him for this. At the same time, I would like to remember one of the founding members, who allowed us to get in touch with Adolfo Perez Esquivel. Alas, this man, Alfredo Pedro Bravo, no longer walks among us. An extraordinary character, Alfredo, as a national deputy of the Argentinean Parliament, proposed over 200 laws, resolutions and declarations of a social nature. He was the president and the general secretary of the Work Union and of the Union of Education Workers of the Argentinean

Republic, and illustrious master of the Ciudad, the autonomous city of Buenos Aires. We all miss such an extraordinary character, which I felt the need to remember on this occasion. Thank you.

SPEECH BY ADOLFO PEREZ ESQUIVEL

Good morning. I can understand Italian, but I cannot speak it. I would like to thank you all for attending this meeting, which is so important for the considerations it offers, particularly in relation to the environment.

When discussing the need to set up an International Court for the Environment, Dr. Casson mentioned the fact that we should all bear our Motherland, our land (what we in Latin America refer to as our 'patria mama') in mind. This our mother: mother earth. If we do not love our mother and our land, we cannot love life. I believe this to be a fundamental point. We cannot live without our mother earth, even when we are dealing with human rights and the rights of peoples. In many cases, when we are dealing with scientific issues, we always think about experts and scientists as confined to the field of their analysis and research; people who deal with social and political issues, however, cannot cut scientists and experts off from social issues. This connection is extremely important, but also gives rise to a question: how are we to reach a collective, peoples' conscience which is not confined to mere research? Every kind of research must have a centre: the human being. If we loose sight of the human being, we loose sight of ourselves.

I would now like to ask you a question: do you like stories, novels? I'm not too sure what you would call them here... Mine is just a question: do you like novels? There's a brief novel by a friend of mine, a great Latin American writer and Nobel Prize winner for literature, Garcia Marquez. Garcia Marquez composed a brief novel which leads one to think about certain issues. It involves an eight year-old boy who enters the office of his father, who is a scientist, an expert discussing world problems. The boy enters the office and addresses his father: 'Dad, I'm here to help you'; his father looks at him and says: 'I'm busy, son, I'm carrying out some research. Why don't you go and play?'. The boy's reply is: 'No, father, I am really here to help you'. His father doesn't know what to do with him, and starts looking for something to amuse him, and finds a magazine. In the magazine he finds a map, a map of the world, and says: 'My son will spend ten days looking at this map'. He then breaks up the map in such a way as to turn it into a puzzle for his son to solve. He gives him a chair and tells him: 'Son, try fixing the world up'. The boy takes all pieces of paper, but doesn't know what to do, while his father continues with his work. Then, at two o'clock, the boy tells his father: 'Dad, I fixed the world up!'. 'It cannot be!', says his dad, 'An eight year-old son cannot possible know all the world!'. He then looks at his son and sees he had arranged the world in such a way as for all small pieces of the puzzle to fit in the right place. He then asks his boy: 'Son, how did you manage that if you do not know the world?'; the boy replies: 'Dad, when you handed me the various pieces, there was a man on the other side. And since I know the man, I first fixed the man on the back up, and then, by turning the page, I had also arranged the world'.

Did you enjoy this story? I think it is relevant to the work the Academy is planning to carry out. This human being, this man, woman, child, boy are demanding a fair place in life. This is the secret, the one great secret. It is this goal we need to meet in our lifetime, for if we do not respect our mother earth and the environment we are not respecting ourselves. This is no doubt a huge challenge, a challenge for the crafting of a new humanity, a new philosophical conscience and new ethical values, which place respect for man over economic values.

All I intended to do now was to provide you with a brief introduction. We will have time to ponder the problem together. I would like to thank you for the work we can all carry out for humanity. Let us not forget that if we do not respect our land, our mother, we cannot respect ourselves. This is a great challenge in a world filled with wars, where millions of dollars are spent for destruction. We are here to create life, not death. Thank you.

GERARDO BIANCO

Yours, Prof. Esquivel, was a splendid metaphor. I will allow myself to make use of it, even in parliament. Perhaps, through this most apt metaphor, something will be understood. You gave us a great lesson in humanism, which I believe might represent a renewal, so to speak, in this new century and millennium. We will have to fight and you are no doubt one the leading figures in this world-wide battle. Thank you.

We turn now to Prof. Conti of the University of La Sapienza at Rome, who, if I am not mistaken, hails from Latin America. Thank you again, dear Noble Prize winner for you Latin American idea of a Mother Earth we are to defend.

4th Paper
CHECKING MARINE POLLUTION: BIOLOGICAL MONITORING
[Speaker: MARCELO ENRIQUE CONTI]

As far as possible, I will try to restrain the emotion I feel in having the great pleasure of speaking after Adolfo told us such important things: means of intervention which go beyond what is merely scientific, and deeply concern human beings. What I will talk about, is our own experience in scientific laboratories where research was carried out on marine ecosystems. I believe my own paper is closely connected to the preceding ones, to those of Prof. Docampo, of Prof. Horst Fischer and of Councillor Casson.

The main problem facing us is how to check ecosystems in a reasonable period of time, with methods which are as less expensive as possible, and how to obtain the amount of information required to provide an answer to the enquiring judge or magistrate who must somehow defend the ecosystem from the attacks of polluters, including intentional polluters. Environmental quality depends on our use of certain methods of experimental inspection on the actual state of the ecosystem. Ecotoxicology, unlike standard toxicology, deals with the effects of pollution and reactiosn to pollution in a given ecosystem. The chief problem, therefore, involves the interpretation of experimental data, which can pertain to the presence of contaminating substances in a given ecosystem. Our interpretation of such data requires methods of elaboration suited to complex systems, in such a way as to do away, as far as possible, with the very uncertainty Councillor Casson was discussing. As ecosystem researchers, we are dealing every day with this issue, not least because of the perpetual problem of obtaining the research funds necessary for our experiments and studies, which are often commissioned by various public institutions. By the term 'effect' we mean the kind of reaction the ecosystem presents, which might not always be of a toxic kind; the ecosystem's reaction, and its quantification, which can be assessed in percentage. The actual effects on organisms vary and can be measured.

Ecosystems, as we all know, are made up of biotic and a non-biotic parts; in the case of the sea, of water and sediments. We can find very different reactions, therefore, and the rise of toxic phenomena might not be an immediate one, and require instead a certain amount of time. Methods exist which allow us to verify processes of contamination before the appearance of toxic phenomena; this is extremely important, if we are to avoid unwelcome events. Actually, if we consider traditional monitoring, although it is based on important methods, it is rather expensive and presents various problems in the case of an intermittent emission of polluting substances; that is to say, in order to check whether a contaminating process is taking place, a number of analysis must be available, for instance the constant analysis of the sea. This table illustrates the major methods used for the analysis of environmental pollution. I will not list them here, but merely point out that they are extremely costly, the machines and operative controls employed being very expensive, the reactants having a cost of thousands of Euros.

Through biomonitoring, therefore, we can study the reactions of organisms, in this case sea organisms, which can provide us with detailed answers concerning the processes of pollution. It is possible to carry out a whole series of individual measurements, to study a single organism, for instance a mollusc or seaweed, and observe the genetic mutations caused, the species' reproductive success, and carry out physiological assessments. Assessing the cellular breathing of certain organisms, for instance, can already provide markers for a process of pollution. For instance, we know that the presence of copper blocks seaweeds' photosynthesis; by measuring their level of photosynthesis, it is possible to know whether a given ecosystem is suffering from certain pressure. When dealing with population, I can observe the level of survival and mortality of a species, its sexuality rate, its abundance, and so on. I can also measure its biomass. In a given ecosystem, it is possible to observe the weight-mass of certain nutrients, etc. Several methods for this exist.

Basically, I would like to show you the data we have collected when dealing with bio-accumulators (bio-accumulators are several kinds of sea organisms which are able, over a given period of time, to accumulate). Organisms can then provide information – and this is extremely important – which can be supplemented over time by the presence of polluting substances in the ecosystem. It is possible, therefore, to obtain pieces of information on a global scale. International programs, such as the Mussel Watch Program, which employs molluscs, and mytiluses in particular, to test for the presence of certain toxic substances, such as heavy metals. Of course, such bio-accumulators must present given characteristics in order to be employed in experiments of this kind. They must have a wide geographic distribution, and be available. The most important characteristic I would like to mention, is the ability of these organisms to respond in a simple way to the surrounding environment, in such a way as for us to link the presence of a certain polluting substance in the organism with its presence in the surrounding ecosystem, i.e. water. Following such a method, once we have set up an investigation plan, it is possible to avoid taking water samples to test for the presence of certain polluting substances such as heavy metals.

I believe many of you know well that conducting an analysis of sea water is a very expensive process, which requires a lot of expensive personnel. It is difficult to test the presence of

a toxic metal in water, for instance, since the sea water must be pre-concentrated to allow instruments to analyse it. Bio-accumulators concentrate the toxic substances present in the water up to a thousand times. By analysing the tissues of these organisms, I can access precious information regarding the quality of the marine ecosystem. Here are a few examples of bio-monitoring involving lichens and bees, which can provide information for vast geographical areas. We know that within a hive, a bee travels for a radius of about 7 square meters. It is possible, as we have done, to check the impact of traffic in a city by analysing the lead present in bees or in beehive products. The same goes for the "Padina Pavogna", which you can see a photo of here. The photo shows the gathering of lichens, of molluscs and of marine phanerogam. Clover, for example, offers a clear reaction. We can observe a modification of its leafage whenever the ozone rises beyond a certain level. International certification institutions have produced experimental clover which can be employed to evaluate the presence of ozone in certain areas, which might have been contaminated, without the use of traditional ozone analysis. We are dealing with standard international methods which have already been certified and can be reproduced. The same goes for lichens, which allow us to observe the effects of SO_2, sulphurous anhydrite, and are therefore referred to as permanent markers for the quality of the air. Lichens are studied to assess the impact of large industries producing energy, for instance in relation to cities. This is something regular analysis can also obtain, but only at a large cost. I have already mentioned bees: bees provide information for vast areas. On the basis of our experiments, it would seem that honey is not a reliable ecological marker for environmental quality, although in the course of our Lazio study of 120 samples, when we analysed the radionuclides of the honey produced in the province of Rome, we were able to observe the enduring presence of the Chernobyl effect. What one can observe, then, is the endurance of the Chernobyl effect through the presence of certain radionuclides. Usually, the aim of a bio-monitoring investigation is to evaluate the quality of a marine ecosystem.

Together with our colleagues from the University of Urbino, we preferred to choose a kind of investigation which would assess the quality of an unpolluted marine ecosystem, in order to check the background levels, the base levels of impact on Italian marine ecosystems. In terms of the studies we carried out in the past 6 or 7 years, the presence of toxic metals. Why should we assess the quality of an unpolluted marine ecosystem? In order to provide a basis which might be referred to in a legal case. Creating a database implies providing a magistrate with the necessary tools to carry out an enquiry on possible unwelcome effects. These images come from the Posidonia Oceanica. The Posidonia Oceanica is an excellent biomarker for the quality of our marine depths. No doubt, the information provided by the radical apparatus is most important, for it also reveals the pollution levels of sediments, where many polluting substances settle, particularly in heavily polluted areas.

What defining the base level and evaluating the state of degradation or conservation of ecosystems means, is to carry out a fundamental preventive action in the study of environmental impacts, in order, that is, to prevent the effects of anthropic activities which might occur in the future; to practice, in other words, the law, and to check the quality of ecosystems over time, or, to paraphrase Councillor Casson, to write the history of a given ecosystem. I would like to quote an example we are still working on in the island of Ustica, which you all know – it is situated off the Sicilian coast. We chose the island of Ustica as a reference

ecosystem because it is the only marine park which, until recently, was in the hands of the municipal administration. Therefore, we can take it as a model for level zero impact on Italian seas. We analysed various areas situated along the four cardinal points of the island, in such a way as to obtain medium data. What interested us the most, was the observation of pollution levels in the nature reserve, so that we could compare its data to that of other marine ecosystems. This here is seaweed which provided a clear reaction; this is a photo of the seabed at Ustica which shows a 'Cistoseira'. The Cistoseira is now globally accepted by investigation programs, and the data taken from this seaweed, the Cistoseira, can be checked for the accumulation of metals with that of seaweeds from the northern seas, in such a way as to obtain data to be compared on a global geological level. This is the seabed off the island of Ustica; the image is not very clear, but you should notice the 'Padina Pavogna' seaweed, which is also an excellent bio-accumulator, and provides useful information.

Let me swiftly move on. This is the sampling phase carried out by my collaborators. It goes without saying, that seabed samples must be taken according to strict international protocols; one has to select markers which show the same kind of development and level of biological composition. This is a picture taken from the nature reserve of Ustica we are currently working on. This is another picture from the reserve. This is one of the areas of Ustica I have previously mentioned. This area is known as Punta Galera, and it is situated near the marine park; by using a little of our imagination, it is possible to see the field of Oceanic Posidonia on the seabed beneath it. This is a photo of my collaborators' marine laboratory of Ustica.

Of course, very strict protocols regulate the processing of samples: samples must be processed according to specific and internationally established norms I will not be listing here. So, what we did was analyse five kinds of metal. I have brought you the preliminary results for three metals which are toxic for this specie: zinc, copper and lead. This is a summary of all results. As we can see, the samples were taken according to specific statistic rules in various areas. From an analysis of this data, we noticed that there are significant differences in the island of Ustica, but that basically the reserve area, as one would expect, is not less polluted than the other areas: at a similar level to other locations, it is basically unpolluted. The various data, therefore, point towards the uniformity of the different areas. On the basis of our preliminary data and the investigations carried out in the past few years, the ecosystem as a whole can be considered uncontaminated, according to standard provisions. These are the average concentrations of metal we have found in the various areas. The apex of the Oceanic Poseidonia, for instance, show a higher concentration, for they are the oldest parts of the plant. This is the graphic display of the phenomenon: the apex show a greater concentration of metals when compared to the other parts. The same goes for zinc, which, as we can see, accumulates more in the apex, in accordance to all literature on the subject. The concentration factor of the plant has been proved to be of 10 to the power of 3, i.e. of 1000. The plant, therefore, can be used as a marker for the base quality of this ecosystem, and has been shown to be an excellent biomarker, particularly since it can be found at all seasons, easily identified and gathered.

The most significant problem with the Posidonia ecosystem, is that it has been altered since 1984 by a 'killer seaweed': Caulerpa taxifolia. This seaweed was accidentally spilled from an

aquarium into the French seas; it is now wrecking all sea floors in northern Italy for thousands of hectares, and is threatening the Ischia ecosystem, which has a Posidonia medow of 16 square meters. Bear in mind that Posidonia is very important, for it shelters up to 300 different animal and plant species. Other markers which were used were molluscs, such as the limpet, a gasteropod (and thus herbivorous creature), the Monodonta Turbinata, which also provides clear reactions.

These are tools we employ: this is a microwave oven, albeit a rather refined microwave oven, which allows us to process biological material. This is a spectrometer for atomic absorption, which costs several dozen thousand Euros, and is used to analyse metals. These are the levels of concentration we have found on Ustica molluscs, which confirm what has already been said about the Posidonia, i.e. the fact that the various areas are all rather similar, as the statistic analysis shows. We also studied the ecosystem of the Gaeta Gulf of the Tyrrhenian sea, with its marine park of Gianula and Mount Scauri. Here we employed local mussels, which are also, as international programs reveal, excellent biomarkers for environmental quality, which can be used in studies of this kind. The same goes for the Ulva Lactuca, a seaweed which grows in predominantly polluted areas, and can provide us therefore with a great deal of information.

In brief, very much in brief, these are the results obtained for the Gaeta Gulf, which show how species have a different capacity of accumulating various polluting substances. Here I only reproduced the case of lead, which shows how the Padina is more sensitive to lead than other species. This is yet another ecosystem we studied: the island of Favignana in Sicily, which can also be considered an unpolluted area. What we did, then, was create a database; this here is the data we obtained by using the same species in the island of Favignana. Unlike Ustica, the harbour of Favignana is five times as polluted as other areas. The various locations in the island are not the same. Areas other than the harbour have in any case provided excellent results, in line with the lowest pollution levels described in the relevant literature. What we did was establish a database which can be employed to prevent possible anthropic impacts in the future.

Let me now outline a few conclusions: the average concentration of metals we were able to register in the five locations in the island of Ustica is in line with the lowest values described in the literature on the subject. We all know that one hundred years ago the first protected natural area, Yellowstone National Park, was established. Allow me to mention the data from the International Union for World Conservation, where the fifth world congress is taking place, and the data offered by the UNEP monitoring centre for conservation. The major problem to be solved involves the protection of marine ecosystems; accordingly, we eagerly await the information Prof. Ceruti, who is an expert in the field, will provide. As we know, less than 1% of all oceans and sees are protected in the same way as land is through natural parks and reserves. The issue of the foundation of marine parks is therefore extremely relevant.

Let me end by mentioning a few positive initiatives taken in this field. One is the protection of the great coral reef of Queensland, where 350 thousand square km will be turned into a nature reserve and less exploited by the fishing industry, while, according to new conventions, there will be significant benefits for tourism. Similarly, Norway established protected

areas for deep coral reefs. Several African countries agreed on reducing intensive fishing and intensive oil exploration. We know that at the present moment 40% of the world population is living on the coast, and this figure alone is greater than that of the whole world population in the 1950s. Here are a few conclusions about the implementation of the 2002 world summit on sustainable development, which made governments the following proposals: 1. to regenerate fish stocks by 2015; 2. to reduce the pollution caused by activities carried out on land, connected to fishing activities, and basically to establish a global network for protected marine areas. No doubt, among the many goals which emerged in the course of the previous papers, the Academy has that of promoting research investments, for this is an extremely relevant problem. As researchers, we are constantly facing the problem of finding the necessary funding to support our studies, in order to establish data-bases which can be used in court cases, to reduce the phenomenon Councillor Casson discussed: uncertainty. Thank you for you attention.'

GERARDO BIANCO

I believe it would be impossible to end this morning's papers in a better way than with a paper which supplements the planning which opened the debate with speeches of a high juridical profile and Prof. Conti's extraordinary scientific conclusion. I dare say, Nino, that the Academy began in the best possible way.

Generally speaking, the vast humanitarian vision of the President and Noble Prize winner Prof. Esquivel, who summarized the basic inspiration of our Academy in a few words, his wide scope, for without some kind of philosophy, a doctrine, and, I dare say, a strong spiritual inspiration, nothing lives on and nothing endures. The juridical rigour of the papers which developed from a general kind of planning and concrete experiences, such as that of Galicia, the general overview carried out by Prof. Fischer, Judge Casson's experience – and I would like to reassure Councillor Casson, on the basis of Conti's paper, of the fact that independent scientists certainly do exist who will be able to guarantee the objectivity of their suggestion. We could not have had a better start.

Nino Abrami was in a sense rather bold, for the term 'academy' no longer charms everyone, to the extent it has even been vested with negative overtones, as something stale, outdated and old-fashioned. What you, Nino, did, was to recover the term and charge it with a new meaning. Unfortunately, I have to express my disappointment at having to leave this afternoon. I would have enjoyed staying, for I received a great personal satisfaction at having been able to open this conference in a most promising way. This afternoon I will be listening to my friend Ceruti's paper, which will be the first. I believe we can count on starting again at 3 or 3:15 pm, although I do not know what the exact schedule is.

Best wishes to all those present. I would once again like to emphasize the exceptional quality and the high scientific level of this conference, things which are particularly valuable when they are accompanied by rigour, for besides the democratic principle of popular participation to these decisions, which was called upon this morning, there is a need to avoid populism. Rigour, science, and excellent will be our standards. It seems to me that this Academy is off for a good start. We are also in contact with Romania, the last area of Roman civilization; so we have linked heterogeneous things which seem to go very well together.

Best wishes to you all; Nino knows that, as far as I can, I will follow your activities. No doubt, it was Nino's plan to make President Adolfo Esquivel, a great humanist with juridical experience and scientific culture, and, despite certain people' suspicion, helping politicians join us. Nevertheless, I believe I'll be able to work in an impartial manner, not least because of my age: old age might not bring wisdom, but it does at least bring a certain detachment from power. Thank you.'

Ducal Palace , Sala del Piovevo
[23 October 2003]
Introduction to the thematic groupshops on the
PROTECTION OF FLUVIAL, MOUNTAIN AND URBAN ECOSYSTEMS

Antonino Abrami

We meet again slightly late, after lunch, but will catch up as soon as we can. The second part of the day, which will no doubt prove as interesting as this morning, I will be handing my place as president of the conference over to Lawyer Vassallo, a member of the Academy. At the end of the day I will make a few closing observations on the first part, which has proven of great interest.

It is now Gianluigi Ceruti's turn to speak. Gianluigi Ceruti requires no presentation. He has been an Italian parliamentary who has shown great interest in environmental matters, the President of the Council for Protected Areas, and the author of several landmark essays on the safeguarding of protected areas. Gianluigi is now also known as the father of the 'Quadro' Law, the law about protected areas – he will be telling us more about this. His paper will certainly provide us with a lot of food for thought. Its title is 'The fundamental principles governing protected areas'. Good luck with your work, Gianluigi.

5th Paper
THE FUNDAMENTAL PRINCIPLES GOVERNING PROTECTED AREAS
[Speaker: Gianluigi Ceruti]

'I would like to thank President Abrami for his kind words of introduction. Historically, the need to protect the environment, nature and its resources, was first felt by States and by the more alert and sensitive segments of society in the XIX century, when the unlimited exploitation of natural resources and the increase of industrial activities began to damage the environmental balance, the landscape, the survival conditions of man and of the animal and plant kingdoms, and to threaten the extinction of certain faunal and floristic species. The peculiar trait of the conservation of ecosystem habitats – today one would add of biological diversity – resides in its substantially defensive attitude, which stimulates the introduction of positive rules of protection in the legislative codes of various States. In the XIX century in England a movement took root, spurred by unrestrained industrial development. The most notable witness was provided by writers, among them William Morris and John Ruskin; the latter, closely connected to Venice, wrote memorable pages about the city. From the years 1870-72, if we were to refer to the establishment of the Yellowstone National Park in the United States, to 1922, a debate on the subject developed in the various continents, a cultural debate on the protection of natural areas, which brought about significant political and legislative initiatives. In these very years the first voluntary non-governmental organizations were established in European countries, along with the first scientific societies to express the need to stem the tide of destructive phenomena which were affecting the environment everywhere in Europe and in non-European countries. In Belgium the "Ligue des amis des arbres" was born, in France the "Ligue pour la conservation des sites pictoresques", in Italy the Società Botanica Italiana, the Gruppo

Naturalistico Giuseppe Regazzoni and the Società Emiliana pro Montibus et Silvis, which had Prof. Ghigi as its distinguished President.

The first of March 1872, the United States' Congress approved the Act establishing the first national park of the world: Yellowstone. This is a natural park extending for 900 thousand hectares along the Rocky Mountains, in the States of Wyoming, Montana and Idaho. The simple and pragmatic norms of this legislative provision state that the area will not be subjected to any settlement, occupation or sale. The Secretary of State – for the area has always fallen under the jurisdiction of the United States' Secretary of State – has the power to lease small portions of the area for a maximum of 10 years for the construction of residential buildings to house visitors, provided all income was subsequently devolved for the administration of the park. The executive norms of the legislative provisions of the Act guarantee the park's preservation from all harm and the spoliation of woodland, mineral resources, natural attractions and sights. The term 'natural attractions' refers to geysers, i.e. the petrified forests created through the combined action of fire and water.

None of the land within the National Park of Yellowstone is suitable for building and transferable. In 1905 both concepts were also drawn on in Italy, when what is considered as the first environmental law of the century was passed: the parliament, under the auspices of Hon. Rosadi, passed a law forbidding all property transference in the pine-grove of Ravenna. I would also like to recall the fact that in 1832 the United States had already applied the concept of non-transference of land to the petrified forests of Arkansas. Regrettably, one should also mention how declarations of non-suitability for building and of non-transference of property in the Mediterranean countries, including Italy, and particularly in relation to its governing class, are not enough to guarantee the absolute and perpetual protection of the land. This is clearly proven by the ease – or, rather, the impudence – with which changes are made to the legislature, by granting amnesties for the infringement of local building regulations, in order to allow the exploitation of coasts for the establishment seaside resorts. In these very days the Parliament is discussing the case of yet another baleful amnesty, for which we cannot but again express our indignation. State property is privatised, no controls over the construction of new buildings are carried out, and unauthorized building activities are de facto encouraged.

Yellowstone was soon passed over. The 50 years I referred to – 1870 to 1920 – witnessed heated cultural debates and rapid exchanges from one continent to another. In 1879, seven years after Yellowstone, Australia established the second national park of the world along the coast of the State of New South Wales. On the 23rd of June 1887, the Federal Government of Canada, thanks to the personal involvement of its prime minister John MacDonald, established the National Park of Banf in the region of Alberta. In the same year, 1887, New Zealand founded its first national park. In 1898 South Africa established the Natural Reserve of Sabie in Eastern Transvaal, which was followed in 1903 by that of Singwitsi. The two national reserves made up the beginning of the Kruger National Park. In 1909 Sweden founded 9 national parks. In 1914 the first National Park of central Europe, the National Park of Engadina in the Grigioni Canton. In 1919 Poland passed a law protecting the whole Bialowieza forest. Following this Transalpine, and indeed Transoceanic cultural trend, in a paper documenting the legislative proposal of establishing the National Park of Abruzzo – today the National Park of Abruzzo, Lazio and Molise - Pietro Romualdo Pirotta, manager of the Botanical Institute of Rome, gave the following warning: "it is no doubt possible to take without ruining, to live without destroying, to earn without leaving our grandchildren's grandchildren nothing but rock and barren land". In November 1921, through an initiative of the previously mentioned

National Pro Montibus Federation, the Autonomous Board of the National Park of Abruzzo was establish. A year after this event, a Decree was issued by the King, through which the Italian State officially recognized the National Park. In December 1922, a legislative provision followed, with another Decree from the King, which established the National Park of Gran Paradiso.

What is the one characteristic common to all these natural reserves, these early national parks which were established in the world? An attempt to protect four fundamental elements: fauna, flora, geological formations and the beauty of the landscape. In the case of some parks, such as Yellowstone and Abruzzo, the issue of areas for recreation and naturalist tourism was discussed. In the case of others, such as the Engadina and the Bialowieza parks, a greater emphasis was placed on the issue of scientific research. In both cases, the protection of natural resources, of the fauna, flora, geological formations and the landscape was a primary, fundamental issue. I would like to emphasize this definition as far as possible, particularly because in the European States, and particularly in Italy, the matter is rather confused, and it is often claimed that protected areas are used for development purposes. The term 'development' has now become equivocal and ambiguous. No one can deny that economic activities, particularly in the field of naturalist tourism, do develop around a natural reserve area, and particularly a park, but this is certainly not the primary function of any natural reserve area or national park. I would like to stress this basic principle. The appeals of scientists, and even of artists, who in France were very much at the forefront of all this, and, more generally, of intellectuals, who prepared these fundamental events in the history of the protection of nature, are all charged with a cultural and ethical imperative, almost an inspirational afflatus, one may say. Every human activity ought not endanger future generation's natural resources – this is a crucial point.

The constant reference, even in normative texts, to present responsibilities seems to refer to the biblical idea of genesis, according to which man is the mere guardian of earthly goods and must therefore behave in such a way as not to abuse them, but pass on what he has received as a temporary consignment, intact, to his successors. After the Second World War, material reconstruction was accompanied by the eagerness to re-engage in the conservationist culture which war events had suddenly interrupted, and particularly in the scientific dialogue between countries. In 1948 a solid dialogue and collaboration among people in the field was re-established at the castle of Fontainbleau, with the foundation of the "Union Internationale pour la protection de la nature et de ses ressources", which is now known as The World Conservation Union (IUCN), and destined over time to become the biggest and most representative world institution dealing with the protection of ecosystem and biological diversity. Last September, the IUCN organized the Fifth World Congress on National Parks at Durban. The principles and the philosophy of environmental protection periodically expressed by the The World Conservation Union, i.e. by the IUCN, have been universally accepted since the end of the Second World War. In these years, the environmental protection network spread all around the world. In Europe new protected areas – parks and nature reserves - were established; given the lack of the kind of widespread wilderness one can find in Africa and in other continents, such protection was also extended to partially anthropic areas. Problems of environmental compatibility emerged, which have only been partly solved through planning schemes involving the partition of the protected land in various areas, each with its own level and means of protection.

At the present moment – and this holds true for almost all European countries, but also for non-

European countries, and for Italy in particular – there is a need not to disprove the essence of a protected natural area. In order to achieve this goal, an ethical attention, if I may use this expression, is required at the hands of the public. The constant vigilance of each citizen is required, and a clear and rigorous evaluation of the actual environmental compatibilities between the need to protect the ecosystem on the one hand, and development project on the other. In the recent Durban congress, which took place from the 8th to the 17th of September 2003, the fact that less than 10% of the entire land surface is protected emerged; the same percentage applies to Italy. What we are dealing with, then, is a small percentage, and precisely because it is so small, the need to curb any other limits to the conservation of nature, any yielding or compromise, which are usually ambiguously justified in the name of a mistaken sustainable development, is so strong. Even at a European level we often insist, and rightly so, on the idea of sustainable development. One should also point out, however, that such an idea has often been falsified and altered in its basic meaning: sustainable development cannot cancel or harm those values I referred to, which are central to any protected natural area. The foundation of a protected natural area, and of a national park in particular, are privileged forms of the conservation of nature and its resources; the establishment of a protected area is not always necessary, but only when, in accordance with a scientific assessment backed by research, the objective prerequisites I have previously referred to – the presence of floristic and faunal species and geological formations of a rare or precious kind threatened by alteration or even extinction – can be found in a given territory. Conservationism is a field in which administrative and political authorities, broadly speaking, cannot take the place of scientific authorities, but merely take note of the information provided by research and legally apply its outcome.

As I mentioned, and could further illustrate – but for the lack of time I will not –, it was always cultural vanguards which provided the impulse to establish protected natural areas in the world. This is what happened in the case of all the most important national parks founded in various continents since the first of March 1872, when the park of Yellowstone was established. Talking about Yellowstone, I would like to mention the fact – and this should please our President Abrami and the magistrates among us – that among the most passionate members of a cultural lobby of natural science researchers, writers and artists was a magistrate, Cornelius Hedges. This man is considered the chief cultural representative and the founder of a public opinion movement in the United States during the second half of the XIX century; he informed the North American public opinion and persuaded high-ranking politicians to approve the foundation act of the National Park of Yellowstone. To this very day, magistrates are at the forefront of our struggle, not only for the activities they carry out institutionally in society, but also for the stimulating cultural role they play with their suggestions, as illustrated by this morning's papers: Prof. Abrami's and Dr. Casson's talks provide the most eloquent proof of this.

In Sweden too, a distinguished explorer and scientist, Nondeus Kiol, and a German scientist, Hugo Conwente, advocated the establishment of natural reserves and parks. In the late XIX and the early XX century, Switzerland founded the National Park of Engadina on the Alpes. All this ferment lead to a series of normative acts, which establish, from the legislative and institutional point of view, the first protected natural areas in the world. A common misunderstanding I would like to dispel, and which I previously referred to, is the idea that it is possible to establish a natural park everywhere and in any way. One should always bear the definition drawn by IUCN during its tenth national assembly, held in New Delhi in December 1969, in mind, since it is still valid: 'a National Park is relatively wide area, where one or more ecosystems are not materially altered by exploitation or

human settlement, where plants and animal species, geomorphologic sites and habitats are of scientific interest'. Scientific interest of a general kind is not enough: parks must be of 'specific scientific, educational, recreational interest, or possess a particularly beautiful natural landscape'. Allow me a brief digression: since it is often said that with Law 431/85, the Galasso Law, this aesthetic concept was surpassed, I ought to point out that this applies neither to the environment in general, nor to protected areas, for the aesthetic concept is still fundamental.
I will avoid reading out any other definition for national parks, but, as I begin to approach some kind of conclusion, I would like to mention the fact that, while it is easier to establish a nature reserve or natural monument, since it often consists of a rather limited and non-anthropic area, conflicts can arise when one suggests the establishment, or is taking care of national or regional parks in areas which already subjected to economic activities and human settlements. I ought to point out that a natural park always involves restrictions of the use of the land, which are often compensated, so to speak, by the concession of economic provisions and facilities. Clearly, all hunting must be strictly banned in the park. A natural area cannot endure hunting in its territory. Any possible excess of wild creatures, such as ungulates, which damage the crops, even in areas close to the park, must be dealt with through the selective shooting of the fauna.
A few closing words: environmental politics are, by their very nature, animated by ethical values, in the sense that no human activity should damage the psycho-physical integrity and well-being of the natural environment, which protected natural areas contribute to ensure. Thank you.'

EUGENIO VASSALLO

Thank you, Prof. Ceruti, for illustrating what I would call the long path towards the establishment of protected areas, a difficult path, leading back many years. We would also like to thank you for discussing a number of points which really impressed me; among them, the fact that no human activity should endanger the activities of future generations. Such principle should be applied to all activities, including industrial activities in Venice. Today we have seen how Public Prosecutor Casson explained a number of truly impressive facts. Another statement particularly worth mentioning is the claim that each man is the earth's guardian. As a guardian, he is responsible for the earth, not least, as we have often discussed with Nino, from a juridical point of view, when he steals what is should be common to all. Therefore, it is a matter of ethical care, as you yourself mentioned, Professor. An ethical care which we should achieve, and our generation should achieve, over time, for the benefit of future generations, to whom we are certainly not passing the earth on in the same way as our forefathers passed it on to us.
The time has now come for another paper, which continues to deal with the project of environmental protection. Prof. Franco Pedrotti will discuss the protection of the mountain ecosystem as a natural and cultural resource.

4th Paper:
THE PROTECTION OF THE MOUNTAIN ECOSYSTEM AS A NATURAL AND CULTURAL RESOURCE
[Speaker: Franco Pedrotti]

'I took the place of our President, whom I would like to thank for two reasons: because he handed me his place here, and because he invited me to this irresistible city. I lived near Venice, in Padua, for 11 years, and today I am most happy to be here. The subject I will be dealing with is complex

and rather technical; I will do my best to make it as easily accessible to all as possible. Let me begin, then, discussing the 'Protection of the mountain ecosystem as a natural and cultural resource'.

'The mountain ecosystem forms a large ecological system which we can call an orosystem (OZENDA, 1998, 2002); it stands as a well-defined bio-geographical model for many reasons, among them its climatic gradient, geological history and variance in altitude. In every continent, mountain ecosystems are the areas which are most rich in biodiversity. Mountains have always been of central importance in man's history and culture. They have only apparently divided peoples who lived on their slopes and have always been at the center of commercial and cultural exchange; in addition, they have always provided a sure bulwark for man, in which to find refuge and protection in the difficult moments of his history. One can thus affirm that the mountain ecosystems constitute an entity of vital importance not only from the natural point of view (physical and biological) but also from the historical, cultural and social point of view.

The model for mountain ecosystems or orosystems. This is the Stelvio Park in the Martello Valley. The bio-geographical model of a mountain ecosystem is based on the identification of the altitude levels from the base to the peak of the mountains. For the mountain chains of continental Europe, this model is represented by four altitudinal belts called the hilly, mountain, sub-alpine and alpine belts, each of which in turn can be further subdivided into sub-belts This is the alpine model. Each belt, which we can see on a map, occupies a certain altitudinal space and hosts specific flora, vegetation and fauna. The various colours give an idea of the various belts. This is a map of the Alps drawn a few years ago by the European Council. In reference to the orosystem of the Alps and simplifying greatly, we might say that the hilly belt is characterized by oak or by similar species with a thermophile behaviour, the mountain belt by beech and other mesophile species, and the subalpine by spruce and other conifers such as larch and cembran pine; the alpine belt, instead, is no longer characterized by trees but by herbaceous species. Today we also know that the "alpine model" can be applied to all the mountain chains of central: the Carpathians, the Pyrenees, the Dinaric Alps, the north-central Apennines, etc.

The Mediterranean mountains seem to follow a "Mediterranean model", parallel to the alpine one but different, because of the higher vegetation belts ranging from north to south and because Mediterranean species are also widespread in the mountains. The "Mediterranean model" has a thermo-Mediterranean belt characterized by oleaster and carob trees; a meso-Mediterranean belt characterised by evergreen oaks; a supra-Mediterranean belt characterised by deciduous oaks; a oro-Mediterranean belt characterised by xerophile shrub species, and a crioro-Mediterranean belt characterised by herbaceous species. Here we can see all mountain systems from Europe to the Caucasus and Urals. According to OZENDA, it is possible to establish a correspondence between the altitudinal belts defined according to their biological content (biocoenotic and ecological) not only among continental and Mediterranean mountains, but also in the mountain chains of Turkey, the Caucasus, northern Europe and of other parts of the northern hemisphere. From a more general point of view, this involves an altitudinal succession of different environments and landscapes, among which there are continuous exchanges, both horizontally and vertically, so that each orosystem constitutes a unique ecological unit, with its own internal equilibriums.

Anthropic intervention caused serious transformations in mountain ecosystems. It can be grouped into two categories: ancient transformations which took place in the course of centuries, and recent

transformations. The historical transformations – here we can see the Sangro Valley in the Abruzzo Park - removed forests from many mountain areas so that they could be put to other uses: in the valley planes, forests gave way to agricultural areas, while on the slopes of the mountain belt they were replaced by meadowlands; on the slopes of the sub-alpine belt – here we can see the Sibillini Mountains – as far as the treeline, they were eliminated in order to provide grazing areas for the livestock. As the case of the Sibillini Mountains shows, these transformations caused the substitution of the original (primary) vegetation represented by the forest, with a secondary vegetation of meadows. Many forest areas were maintained, but the high forests were transformed into coppices and their composition was probably changed; in the Alps, for example, spruce was often substituted with larch, and in the Ardennes, the red-deal replaced the durmast.

In the deforested areas man then built inhabited centers, cities, suburbs, villages, isolated homes, farm-houses, etc., all with their own characteristics according to the cultures, local traditions and materials available, and according to their connections through main roads. Here, for instance, we can see an Apennine landscape, the Laga Mountains, where woods were turned to coppice, and the general state of the vegetation is extremely degraded. Here is a mountain near Pergine in Trentino, where all vegetation, albeit aesthetically pleasing, is entirely artificial, since larches replaced the original oaks and beeches.

The various environments that compose the orosystems can be grouped into three categories. Here are some examples: excavations and various kinds of interventions I will avoid commenting. Let us begin from this distinction of orosystems into three categories, drawing upon the ancient but ever valid nomenclature of Latin: sylva, saltus and ager. The sylva (forest) today maintains the greatest degree of naturality both in terms of saltus (uncultivated land) and of ager (cultivated fields). The problems of the forest are the following: in the cases in which the state of conservation has not undergone variations caused by man, in the forest there is in act an internal equilibrium which is able to maintain itself over time; this is the case of primeval forests, the last strips of which still can be found even in some orosystems of Europe; for instance, in the Gargano Park, or the Forest of Umbria or Sassofratino and the Forest of Quarto. Here is a photo. Here is a detailed study of the foliage; here are the projections of the trees' leaves in a parcel, the Pavari parcel, one of the best conserved of all the Forest of Umbria. We can also find wonderful examples outside Italy. This, for instance, is the Bialowieza forest, on a plain, but always in Europe. Here we can see the Carpathian forest, which exists as a nature reserve since the late XIX century. This is a forest on the Lagodekhi Caucasus, where one can find colossal trees. Here is one of these trees which has fallen.

Provided these are all exceptions, situated in protected areas, most of the forests of the Alps and Apennines are undergoing a process that specialists define as degeneration, as opposed to regeneration, which takes place when man's intervention is more intense. In other cases, being a renewable resource, it can also regenerate. This beautiful example is provided by the Toricchio nature reserve in the Marche. All the Apennine area in the Marche is subject to this phenomenon, whereby a bird drops a seed in an arid grazing land, giving birth to a bush, from which a shrub develops. This will be the future of the Toricchio reserve in the Marche, and of almost all the Apennine area.

In terms of the ager, problems have become particularly acute in recent decades because of the enhancement or the abandonment of agricultural practices. In the first case, new methods of agricultural utilization have been introduced (mechanization) as has monoculture using all land avail-

able (as in fruit trees in Val di Non, Trentino), while in the second case, agricultural practices have been abandoned because of changed socio-economic conditions compared to the past. In the case of the saltus, the most widespread phenomenon today is the abandonment of livestock grazing. Here we can see the plateau of Macereto in the Sibillini Park in the Marche, where the grazing land has been completely overtaken by shrubs, which will lead over the course of time, if man allows it, to new woodland, through a process of secondary succession.

These phenomena are characteristic of almost all mountains, but not limited to mountains alone, extending to plains and hills all over Europe. Some people are concerned about the possible disappearance of a landscape crafted by man (thus secondary), but nonetheless of great aesthetic attraction, such as the meadows. I would like to voice my opinion, which derives from a certain amount of experience, which we might like to later develop in our workshop. In terms of aesthetics, one can say that the meadows constitute a landscape that doubtlessly has its charm, but which will be substituted by the primary landscape of the forest, which everywhere is urgently needed for very important ecological reasons. Let me just quote three examples: the defense of the soil, which we have previously discussed; the absorption and accumulation of carbon dioxide in tree trunks; the mitigation of the climate in hot and dry periods. Consider a country like Italy, which has very few forests indeed: what kind of contribution would this provide? A most positive contribution, I dare say.

To think of stopping the vegetation modifications underway due to a change in man's relationship with nature is not only anti-historical but also impossible, if not in limited areas such as the protected areas throughout Europe. Here, for instance, you can see a medow. Prof. Vasile Cristea, who was mentioned this morning, but couldn't join us here, is the vice-Chancellor of Cluj. This is a cultivated area of a few hectares, with a nature reserve – here we can see it again – where rare species grow. Here you can see an old man, an eighty-year old farmer who has worked as the reserve custodian for many years. These are all professors from Bruxelles and various European countries. Here you can see the meadow, which must be mown in order to be maintained. All these are but isolated examples.

Sylva, saltus and ager today are menaced by a progressive and generalized anthropization through the continuous through infrastructures for tourism, and so on. Another problem is the fact that in the mountain systems of the countries of eastern Europe, such as Romania, there is also the danger of intense deforestation, not unlike the one we faced 100-200 years ago, for one simple reason: the production of lumber for countries of western Europe (in particular Germany and Italy). The wonderful forests of the Carpathians, of Bucovina, of Maramures and of Transylvania today are facing a great danger that is very difficult to battle, because on the one hand the West needs lumber and on the other the East needs cash and development. I don't know what can be done.
Let me now briefly discuss the issue of protected areas. In the protected areas, which Hon. Ceruti previously discussed with great detail, one would think, stewardship of the natural environment and in particular that of the sylva, which is what I am interested here, would be easier; but this is not the case. In fact, even today in Italy– notwithstanding the proposals to this effect that have been produced – no policy is applied in the national parks to promote forest development. And yet one of the great possibilities offered today by the national parks (and by the other forms of protected areas) should be the recovery of degraded ecosystems. Often it is said that the national parks in some European countries, Italy among them, were established in territories where man's influence

had been felt for centuries, from Roman time and beyonds, and thus it should be right and suitable to perpetuate this situation for years to come; however, these affirmations are very reductive and surely do not take into consideration the conservationist needs that derive from the existence of the protected areas. They can be accepted for some anthropic, seminatural and cultivated landscapes, as in the case of the "difese" of Abruzzo and of the "merigge" of the Marches (beechwood-culture), but they certainly cannot be acceptable for the thousands and thousands of acres of deciduous woods, sparse and shrubby, that above all are worth little or nothing, after centuries of cutting, grazing and carbon production. We can even find some national parks in Italy who support carbon production. I'll leave you to draw your conclusions.
I have tried to sum up the problems connected to the conservation of these ecosystems in the four main points you can see; behind them is a photo of the most degraded area of the Toricchio nature reserve, which one day, perhaps in 100 years' time, will be a vast forest. Firstly, we face the need to maintain representative samples of all the mountain ecosystems (composed of the beechwood, pinewood, sprucewood, etc. I previously mentioned); secondly, the need to maintain the ecosystems in perpetual function, in order to guarantee their future use for coming generations; otherwise, we are only fooling ourselves. We also face the need to maintain the biological diversity that characterizes these ecosystems, and to maintain the genetic resources that govern biodiversity, i.e. the genofund. This is only a brief summary, but all these points would be worth commenting in detail. It is not possible to do so here, but we might consider doing it during our workshops. These concerns are weighted with great responsibility, not only of a scientific nature, but of an ethical one as well, as Dr. Ceruti previously observed, given the continuous, progressive and unstoppable environmental degradation involving not only the mountain ecosystems but the entire planet.

The search for solutions. In 1974, at Trent, an international symposium focused on the Alps and organized by the Union Internationale pour le Conservation de la Nature, Conservation e développement d'un patrimoine européen took place. An 84-point "Action Plan" was approved that contained one specific reference –from different points of view – to conservation of ecosystems. Subsequently, the 84 points were taken up again above all by the C.I.P.R.A. (International Commission for the protection of the Alpine regions), variously discussed, and in 2002 the International Convention for the Alps was approved. I will not dive into further discussion of this issue, since other speakers will be dealing with legislative matters. I would like to mention, among the numerous legislative measures adopted by European countries, Italy among them, the Habitat Directive. When one considers the world situation in the past 30 years – in 1974 I was the Congress' secretary, while Senator Giovanni Spagnoli, at the time president of the Senate and of the Italian Alpine Club, was its president -, it would seem like these measures have not always seemed sufficient. This can be confirmed by many examples, but I will only refer here to the case of the Stelvio National Park, two zones destined for the construction of new ski complexes in Lombardy. If this happens, as by now seems inevitable, it will be against the principle of nature conservation in protected areas and no kind of reasoning (neither administrative, nor legal, nor ecological, nor economic) can justify it. Georgescu-Roegen's affirmation seems more than ever salient: "The current tendency in the evolution of the planet does not depend only on the inexorable laws of nature, but it is a consequence of the deliberate actions done by man on nature itself". Everything, therefore, depends on man's choice, but the idealism that characterized the great pioneers of nature protection of all Europe, which Dr. Ceruti previously mentioned, now seems almost entirely forgotten. Thus we need a stronger, closer connection between today's pragmatism and technical ability and some general principles, ethical as well, from which we should draw inspiration.

The events which took place in the past 30 years should inspire us. In the case of mountain ecosystems, there is no need at all to start from scratch, since a great deal of work has been done from the post-war period till now; rather, an interdisciplinary approach is needed to deepen understanding of the complex aspects of orosystem conservation as unitary systems. In doing so, we must keep in mind that the orosystems are inhabited by man, and that he has greatly changed his customs and his relationship with the environment to which he has adapted for centuries. On the other hand, man's co-habitation with wild nature, after all, is not an insurmountable difficulty: let us think of the Sangro Valley in Abruzzo, where we can find about a dozen cultivated villages, and, at the same time, wild bears. The best example, however, comes from the Caucasus, where I have been several time: the Lagodekhi Nature Reserve, which I previously showed a picture of, is an area of 20,000 hectares with an almost virgin forest on the slopes of the Caucasus, with colossal trees growing, or uprooted and strewn on the forest floor, as I have previously shown to give you an idea. There are no such forests in Italy. This forest is situated at the southern boarder of the Caucasus area, in a vast cultivated plane with vineyards and human settlements. The vine is grown below such an archaic and original landscape. I believe this, just like the case of the Park of Abruzzo, is an excellent example.

It is important to be conscious of the choices made with the institution of the reserve and to be coherent with the choice made. The Stelvio Park was not established with all the uses it is put to today in mind. We might as well avoid calling it a park and do away with all this harmful amiguity! It seems as if the Stelvio Park is in the process of being demolished. It is important to be conscious of the choices made through the establishment of a natural park. Lagodekhi dates back to the XIX century, but coherence can be found there. Greater strictness for the protected areas of the orosystems (and, more in general, for all protected areas) is indispensable, particularly at the light of these European experiences (which I can claim to know well through my studies and researches). The issue of territories outside protected areas is different, as they are and always will be much vaster. Man needs both. Thank you.'

EUGENIO VASSALLO

'Thank you, Prof. Pedrotti, for presenting, as a professor of nature and natural resources conservation, that specific European ecosystem and Europe through its ecosystems. Also, thank you for mentioning how man and nature can go together, provided man respects nature, and for describing the difference between the Latin terms you used, the sylva, saltus and ager, so well. Yours was a clear explanation of this natural environment, of how it varies from grove to uncultivated land, and your paper offered us a most interesting analysis. I would now like to introduce Prof. Jean Marie Martin, European Community consultant, who will discuss a most intriguing problem: 'Urban development: a major challenge for research'.

7TH PAPER
SUSTAINABLE URBAN DEVELOPMENT: A MAJOR CHALLENGE FOR RESEARCH
[SPEAKER : JEAN MARIE MARTIN]

'I would like to begin by pointing out how the object of our Academy is that of promoting a sustainable development for the environment and man, and to identify the environment. I think I would consider myself an expert in the field, and, having spent the past 8 years in Italy, almost Italian. I

would like to discuss all these issues, and, since I am working for the European Commission, I will also discuss the Commission's work for sustainable development.

There is no need for me to remind you of the three pillars of sustainable development. You know well that they have been recognized since 1987. In those years, we were already engaged in a debate on sustainable development, which should never endanger the future of coming generations. During these very years, the three pillars of the environment, the economy and the social aspects constituted sustainable development. We could spend a lot of time discussing sustainable development from a historical point of view. We might also discuss the Rio conference and Johannesburg. Instead, I would like to mention the European Commission, and point out that the European Union accepts sustainable development as an important issue, and that the Gotemberg Council turned it into a central point in June 2001, thus supplementing the economic aspect which the Lisbona Council discussed. At the time, the decision was made to attempt a new approach to politics, to invest all three pillars with an equal amount of attention, no longer only man, society and economy, as the Lisbon Council had suggested, and to consider the environment an extremely important factor. What this means, is that environmental problems can then be fitted within the scope of our European policies. This is what I was keen to mention, although my personal view is not limited to these three pillars.

I do not believe that these three pillars are in any way significant, unless we also take the fourth pillar into consideration: the institutional pillar. Without institutions, we cannot take the environment, society and the economy alone into account. What we also need is a co-decisional process, that is to say: a centralised system moving towards a decentralised one; the implications of this in relation to the three pillars are various. As a last point, I would like to discuss the fact that the results of sustainable development affect the quality of human life. This leads us to the evolution of the very concept of development, for while at Rio the environmental pillar was extremely important, it was less important at Johannesburg. No doubt, the fight against poverty has become the central point: eliminating poverty has become the crucial issue for all humanity. This might change our own perspective, but I would like to add the following question: what kind of research is required to reach a sustainable development? It is not a problem which can be easily solved; it is being discussed by the organizers of this conference, but finding an answer is not an easy task. For years, I have been the head of an institute dealing with the environment. We consider the environment, which is directly connected with the economic and social pillars, and apply a kind of sectorial research.

In order to reach a sustainable development, all these elements must be in place. What is most difficult, is to carry out the research required for a sustainable development, which deals, as I mentioned, with these three pillars. No doubt, the three pillars are interconnected, but if what we are searching for is an integrated development, was kind of research are we to carry out? What kind of markers are required to understand the stage we have reached? In order to answer these questions, I think we should return to the following concept: within the framework provided by the formal definition given by Bruntland, the presence of two elements which underline the problem of our needs, and a precautionary principle, that of guaranteeing future generations the resources for their survival. This leads us to the three priorities in the field of our research, as they emerge from the given definition: resource replacement, including the replacement of non-renewable resources, for instance through the development of solar and photovoltaic energy; secondly, the need to manage our resources in a better way, as in the case of fishing, which ought to be managed in a more effi-

cient way, or there might not be many fish left in the Venice lagoon; then, an unacceptable situation ought to be put right: how are we to deal with the several polluted areas, particularly in central and eastern Europe? This is a problem.

Another useful concept is that of the political cycle, and of the research which follows it. You can certainly understand the political cycle better than I do – there are many experts among us, including social sciences experts. One starts by defining the problems, provides a political formulation, implementation and monitoring, and, if necessary, a political reformulation. Here we can find various kinds of research: the basic research or precautionary research, which continues, even when a policy is implemented (and the correct policy ought to be implemented). Later in the political cycle, one deals with a search for evaluation and support. No doubt, the best practices must be carried out, and markers must be employed in order to check the level reached, even if the prearranged policies are actually implemented.

I opened my paper with a few examples taken from sectorial research, which is a common method to deal with sustainable development. The environmental pillar is clearly very important. We all say it is part of sustainable development, and that it is well integrated in the DPSIR definition; so we have a social and economic aspect - changes, for instance, in transport systems –, which will have an environmental impact, for the introduction of different vehicles will affect the concentration level of polluting substances, and have an impact on the ecosystems and human life. Politicians will have to implement the best possible policies to solve all these problems. I must say most environmentalists are satisfied, but that this is not enough. We ought to integrate all these different elements in a better way. The major difficulty I would like to illustrate with these colour slides is of a different kind. It consists in non-linearity, for these problems should be known not only to environmentalists; consider climatic heating, for instance: when the temperature of the whole hemisphere rises, as in the case of the problem of the Arctic Ocean, the whole density of the surface of the waters can increase. You all know that this water moves towards the south, along with the circulation of the Gulf current. If we don't prevent this from happening, it might even disappear in a few years. We also have to deal with multiple causality, of course, which is not the only cause of this process, but is connected to all other aspects. For instance, you might have a nice dinner, have a smoke, and the morning after you might, or might not, have a headache; if you drink a lot and eat a lot, you are bound to have a headache the next day, although there is some uncertainty on the matter. I would later like to discuss all these elements. So, evaluating uncertainty is a truly essential phase in politics, along with the evaluation of risks, which are connected to probabilities, the risk of certain damages which might occur, whereas uncertainty requires prudence. I have no time here to discuss all these problems, which are currently being discussed in northern Europe.

The problem we will be dealing with here is that of environmental uncertainty and sustainable development. The people who make decisions need to provide urgent answers, before definitive scientific conclusions are made available. This leads us to change our perspective on science. Politicians need more means of evaluating the quality of information, rather than any truth coming from individual claims; we ought to move from a reductive science to a more useful kind of knowledge. This was developed by several people, Funtovitz and Ravez among them, who developed a new method of dealing with the series of problems connected to science. One ought to focus on certain aspects, in order to solve problems, rather than base oneself on traditional scientific practices. We are indeed dealing with the issue of uncertainty.

If no more birds can be seen in the lagoon, the cost of this should be quantified, and what Funtovitz did was precisely to outline a document on the disappearance of birds. We ought to consider the value of all this. It is hard to apply a standard scientific approach. I certainly believe in the need to extend the participation of experts in the field, but this is something which requires a cultural change. Mine is only a summary, but we might go on for a long time discussing the problem. We are know dealing with post-normal science. In post-normal science – you can here see a diagram and the decisions to be taken and the uncertainty surrounding each decision. In the case of normal science, we are dealing with sectorial science, and can provide effective answers to the various questions posed. If we know move upwards, you can notice how a certain judgment is required. This is not an easy task, and a certain ability is required, along with the time and courage necessary to make a decision. But if we turn to post-normal science, then we really need something more. This is a new scientific dimension. I know that many scientist consider this nothing more than idle babble, but given the uncertainty surrounding the issue, people are now working on uncertainty, to find a way – and this is not an easy task – to measure the existing uncertainty.

Yesterday, I attended a meeting. Some European institutes deal with uncertainty and consider it one of the most important problems connected to research. How can one measure uncertainty? Naturally, we can also discuss this problem, and provide various answers, which are certainly not new. During the '60s and '70s, the people of my own generation carried out an analysis of the system and of integrated systems, which allowed various experts to compose complex systems, to assess the level of pollution, etc. All this was more of a failure at a local and regional level, than at a political level. Models were developed for users: during the 1980s everything was rather simplistic, but little attention was paid at the time to environmental problems. In the 90s, one finds an integrated evaluation, an integrated modelling, with the 1990 definition of 'Drozman' and 'Nasselt'. Three words I believe to be particularly significant here: interdisciplinary – but this is not a new word, merely one of the processes of participation – , participation and communication. This is a two-way communication between experts and users, something very important. No doubt, experts should not only make decisions: some form of interaction is required. This is a process of integration in which what is to be integrated is the scale. This is an important problem, for a model cannot be understood unless the global scale is understood. All other models should then be integrated, the analytical models provided by data and decisional models. All kinds of models must be integrated. These very problems are the key-issues.

A lot of courage is required to understand all this and to integrate the various compartments I have discussed in relation to sustainable development. Two approaches are possible. Once we have identified the system, a participative approach, which I would briefly like to discuss, is also possible. This approach is never taken by experts, but it also requires exercising political power, and a group of experts, etc. It is better known as the classical method. We then have other examples, such as the one of IPCC and Autooil to determine the effect of emissions in Europe, which is a more scientific method. Our solution is to be found halfway between the two kinds of approach, which must necessarily communicate one with the other.

What point have we reached, then? I would like to provide you with some markers. I will show you two graphs illustrating sectorial markers. Now take the environmental pillar alone into consideration: this was used by the OCSE and by various other groups, with sulphur, for instance, as a mark-

er. There, we ought to consider environmental degradation and environmental welfare markers. For sustainable development to be achieved, this parallel line must always be present. Here you can see NOX, SO_2, due to the implementation of the laws. We then have the GDP, which must be taken into consideration. In this case, sustainable development has clearly not been met. In terms of integrated marks, I like to use this graph; here is the GDP, the standard gross domestic product. These are society's expenses; here are the markers which remove all GDP costs for society, such as the use of natural resources, economic and environmental costs: you can see how the gross domestic product increases; if the cost for society connected to pollution decreases, you can see one line growing, and the other dropping.
I would now like to reach some conclusion. I have been speaking for a while, for more than I was expecting, but there are still a few issues I would like to deal with. Experts alone cannot deal with the complexity of sustainable development: this, I believe, is an acceptable claim. We ought to pass from a reductive science to a post-normal science, which mainly implies dealing with uncertainty. One way to do so among others, is to develop and apply markers, such as integrated markers, for the data required. Less and less data is gathered, and we need more data to develop markers. I would like to sound optimistic, so let me end with a positive example: the IPCC, i.e. the inter-governmental panel for climatic changes, takes all these markers into account, and has offered politicians extremely useful data. This is a positive example, and I believe we should follow the IPCC's approach, which has proven most useful.'

ANTONINO ABRAMI

'I would like to thank Jean Marie Martin, whom I have the great pleasure of meeting again, after our first meeting at Turin, when, as he might recall, we had both been summoned for a U.N. project at Lingotto, to discuss the issue of protected areas, along with our friend Ravera and others. If it is true, as it is commonly said, that more data enrich a conference, then Jean Marie Martin, who provided us with so much information, is certainly to thank. He raised several questions, one of which the Academy, and our conference, must certainly deal with: he used the term 'uncertainty', which was mentioned by Dr. Casson as a juridical certainty. We can here draw a parallel between juridical and scientific data. One problem is that of the scientific certainty Dr. Casson was talking about, the uncertainty of reaching certain points of reference, certain norms and criteria on which to base our decisions. We'll be dealing with this later on. I would rather talk in strictly environmentalist terms; what I mean, is that we ought to bear in mind the environmentalist issues connected to economy and man. What I would like to talk about, then, is of danger, rather than of certainty and uncertainty, for, from a juridical point of view, danger is the possibility of an event occurring contra legem, against juridical provisions. This means that it is necessary to take the issue of the danger of certain substances and activities into consideration with the principle of precaution in mind, and assess how it compares to the principle of prevention. This is a broad debate, but no doubt a most interesting, central and stimulating one. The reference points and criteria must be understood. It is chiefly an issue of terminology, starting from our definition of environment. In this conference, as in many others, this issue is little dealt with, but we will try to deal with it. For this and all the other issues of great interest Jean Marie Martin has discussed, for his dialectic contribution, I would like to thank him. We shall learn from you to face our problems together. It is now Lawyer's Vassallo turn to speak'.

EUGENIO VASSALLO

A fellow of ours, who is well-known oncologist, Prof. Giuseppe Cartei, will discuss the health hazards arising from pollution.

8th Paper
THE HEALTH HAZARDS FROM POLLUTION
[Speaker: Giuseppe Cartei]

'Dear moderators, friends and kind audience, I would like to open my paper with a little story, which is nonetheless true. In the rice fields of south-east Asia there live anopheles, i.e. the mosquitoes which carry malaria plasmodium with their larvae, along with billions of frogs, rats, snakes and eagles. The frogs eat the mosquito larvae, the snakes eat the rats, and the eagles eat the serpents, in a wondrous balance. In Europe and other countries, it is fashionable to eat the back legs of frogs. The small animals are exported, leaving the hungry rats, hungry snakes, and hungry eagles behind. This is a fact. Another problem is the proliferation of the anopheles: malaria is making a comeback in those areas where it used to be rather uncommon.
Let us now turn to polluting substances: we know we cannot eliminate them. We too, who are all keen to respect the environment, are burning the notorious oil. In buses, 'vaporetti', cars, trains and aeroplanes, we all burn petroleum. If you made use of an electric vehicle, someone produced electricity for you by burning petroleum. This is only for our travel, not to mention all the rest. But we cannot change today's society. What is most important, is to limit the risks and make the situation more acceptable. It is worth mentioning the fact that the general concentration of these polluting substances in the environment is rather low. There are urban legends about how leaving one's house is a cause of death. Actually, the opposite is often true: at Ravenna, notably one of the most polluted cities in Italy, the pollution level of the plaster on the inside the house is higher than the pollution level chemically measurable on the walls outside, if the house is that of someone who smokes. In any case, in some work places – we ought to take drastic action here – polluting substances can be extremely concentrated, and cause serious illnesses. It has been reckoned that 1-5% of all cancerous illnesses are due to the presence of these substances. Bear in mind, that risk divides men in two categories: the lucky and the unlucky; since industrial complexes are more commonly found in plains surrounding cities, the air in industrial areas is more polluted than the air in rural or mountain areas. Air pollutants are one of the causes of lung cancer. This is not an individual statement, of the kind one may often hear; there are specific studies, conducted on broad sectors of the population, also with metanalysis methods, which confirm this. Which are the most dangerous polluting substances we breathe every day? Those deriving from the combustion of fossil oils, i.e. everything which comes from the underground, including petroleum, gasoline, gasses, etc. The internal-combustion engine is particularly polluting, and so is what we use for heating, ranging from mere hot water, to room heating, both residential and commercial. Wood combustion is less frequent. Also, don't forget about the great engines, which continue consuming, even if we can't see them (I am talking here, for instance, of the great thermal plants, which burn gas, and of big industrial machinery of various kinds). I am now also thinking about the controls we should carry out on artisans, since many control industries: the worker in a big factory is more protected than the artisan working on his own.
Ammonium, one of the substances which are toxic for vegetation, has its origin in certain agricultural activities: the production of feedstuff for animals raised for consumption, the combustion of biomass – it is frightening to work out the amounts of this substance which are released each time a forest burns, which almost seems like a national sport in Italy -, and the combustion of fossil oils for domestic cooking purposes in certain areas, such as China. Plants suffer in a complex way, ranging from the simple suffering one can witness in passing through a forest, to a reduction in growth and productivity. The plant becomes more sensitive to cold, heat and draught (an ever growing

problem). Its sensitivity to micro-organisms also increases, since plants can suffer from virus and funguses, and, in some cases, from bacteria.
Let me get back to the issue of lung cancer, since it constitutes the major cause of death, in women too. Other illness, which are also on the rise, such as breast cancer, can be cured more easily; lung cancer, on the other hand, is more difficult to cure. In urban areas, a direct correlation exists between air pollutants and lung cancer. In any case, the major problem is constituted by inhaled tobacco smoke, as well as by local high-risk industrial complexes. Tobacco smoke is certainly one of the toxic substances that can immediately be removed. One usually thinks it is others who ought to take the first step: the State, industrialist who are not among us, politicians issuing laws elsewhere, magistrates in some far-off law court... Actually, it would be enough for individual citizens to stop smoking, and we would witness a 60% drop in cancers of this kind. This is a fundamental issue, willingly discussed, but grudgingly applied. In vast rural areas of China, hundreds of thousands of people cook and roast certain foodstuffs in their own homes, without having a chimney. In similar conditions, even if the inhabitants of the area do not smoke cigarettes, or do not inhale other kinds of tobacco, they are likely to suffer from lung cancer.
This colour slide shows the damage caused by arsenic in various processes carried out by industries and craftsmen, as well as that caused by asbestos, which is mainly used because it is fireproof. In western countries, appropriate laws have forbidden its use, but little is known about the situation in the east. Asbestos causes malign mesothelioma, which is generally deadly, and occurs almost exclusively among those exposed to asbestos for professional reasons. Radon, as you know, is a radioactive gas deriving from the decay of radium. We have known for years that miners fell ill of cancer far more commonly than workers at a sea level. The reason is, more radon is to be found in the bowels of the earth. Bear in mind, that people living on the ground floor are more likely to suffer from cancer than their neighbours on the fourth or fifth floors!
We all know that to quit smoking is a healthy choice. How long are we still exposed to the risk for? If a person had been smoking more than 20 cigarettes a day, the risk of getting cancer endures for 15 to 25 years after he quit. Also, consider the risk child 'smokers' run, that is to say: children who breathe in passive smoke; some kinds of lung cancer can develop when an individual is only 20 to 25 years old, because as child, from his infancy to the age of 10, 11 or 12, he had been breathing his parents' smoke. With this colour slide you can see how those who don't smoke – on the left – run a certain amount of risk, which we call 'one'. The level increases as the age a person started smoking decreases: in the case of someone who began smoking at the age of 15, it is multiplied almost by 19. The habit of smoking does not seem to be decreasing among teenagers, but it is diminishing among those over 25. Globally, the risks run by young people who smoke is very high, and schools should carry out an informative program. Don't see this as something repressive: these facts constitute our moral duty to inform.
Let us now see what happens when one stops smoking. It takes over 20 years for our risk to cease. Bear in mind, that cancers emerge for combination of causes. The risk of getting lung cancer without being exposed to asbestos and without smoking, can be called 1; the level of risk of those who have been working with asbestos, but have never smoked should be multiplied by 5; the level of those who have been smoking and have also been exposed to asbestos, should be multiplied by 55. These are frightening figures. Many work activities, even those for the production of pharmaceuticals, can be highly toxic (I refer here to the colour slide). The number of toxic substances is always on the rise, because of the research for new substances and their production. This is a most humane and wondrous growing fight, but we do not always know what happens with the so-called by-product. There are many chemical compounds, and their quantity is impressive.
But does one always die from these pollutants? Luckily, no. Many illnesses, caused by inert pow-

ders smaller than ten micron and active chemical compounds, are benign. Children are starting to suffer from asthma at an age which was previously non-exposed. Let's now also take the ozone problem into consideration (colour slide); look at the wonderful list of illnesses we are currently suffering from: pharyngitis, sinusitis, laryngitis, tonsillitis, bronchitis, asthma, a long-term loss of the lung function, emphysema. The ozone: you all know the relation between the ozone and meteorology. In California strict pollution laws exist, which the other States are not compelled to respect. So we have automobile companies which produce cars which can spit out what one pleases, but which must adjust to strict regulations in order to be sold in California. No one applies the protection laws used in California to us, including companies! And what about waters? Don't worry about the fact that 30% of the water pipes in our municipalities are made of asbestos: no one will manage to change the situation, and we often don't even know where the pipes are. In our municipalities we have no maps that say: 'this is asbestos, and this is gres'. Luckily enough, drunken asbestos is not dangerous. Waters can be dangerous for the presence of germs (I will not discuss these, which are not actual pollutants, here), but they can absorb what we fill the earth with: vinyl chloride, benzenes, nitrates, nitro amines, some of the pollutants found in water. I will now mention a complex biological problem (we have already pointed out that there are many causes of cancer). A women who is already likely to suffer from uterus cancer for viral causes (colour slide), will increase her risk through smoking or the absorption of nitro amines through the water she drinks. Just consider the fact that in the cervical mucus some of these toxic substances can be found in a concentrated form, and it is precisely 'the mouth of the uterus' that the virus attacks! Luckily, a sufficient number of repetitions of the so-called PAP test can reveal the presence of the cancer in time and make radical cures possible.

Of course, you all know about pesticides, and about Seveso, industrial solvents and waste combustion: we ought to be careful about things like these, which might happen near our own homes. Waste cannot be gathered and burnt at a ground level without any security aids, without giving way to huge risks for the absorption and percolation of waters. Let us now consider something we all think about: the hole in the ozone! You know how the stratosphere, at 15 to 45 thousand meters, is high in O_3. What does this O_3 do?
It stops ultraviolet rays. If it weren't there, we'd be dead: ultraviolet rays not only give us a tan, but, were they to hit us directly.... well, they would tan us alright! So, what have we done in order to decrease the level of our protection? We have made the bright choice of using ultra-light propellant gases, which rise up to the ozone protective area and dissipate it. Right from the morning, we use shaving cream in a spray can, we are releasing these propellant gases! We use them in refrigerating systems (fridges, air conditioning, etc.). The dissipation of the ozone layer makes the passage of ultraviolet rays possible, and increases our risk of getting skin cancer. Are protective creams useful? They are, with a protection level of 16; above that number, they are useless. Anyway, do protect children and avoid sun burns. Don't expose them in wintertime to the sun of the other hemisphere! Can we clean the environment? Not 100%, so try not to pollute. However, we can reduce part of our consumption, but where are we to put the dirty stuff? Please excuse me if I am not using scientific language, but this is the idea I want to express; I might be using difficult words, and you might not understand what I am talking about. Perhaps we should place these pollutants in drums covered of some kind of material, cover them in cement and sink them deep in the sea, and hope for chemistry to transform these substances in harmless products. As for radiations, there is no acceptable level of toxicity: even the smallest level of radioactivity can cause illnesses. No doubt, the higher the level, the more likely the chance of falling ill.

To sum up, we might say that in order to live longer and better we have had to (?), or foolishly wanted to (?) forget about environmental pollution, and that we choose death (smoking!) for ludic reasons. These matters are worth pondering. We should at least teach the young to care about the environment, that is to say: about themselves. Who wants to ignore this, or perversely, and for economic reasons, continues to make mistakes, is worthy of no respect, and should be punished for contributing to the deterioration of others' health.'

ANTONINO ABRAMI

'I must confess, I will make an exception here: usually, one starts by talking about the contents rather than the person who expressed them; but in the case of Cartei, as in the case of Perez Esquivel, I would like to spend a few words to tell a brief anecdote. In his great scientific spirit and immense modesty he might have missed this one. Some time ago, a scientist, one of the many minds 'stolen' from abroad – for the 'inactivity' of our politicians –, in a university I will not mention by name, gave a wonderful speech in a crowded hall, filled with chancellors and great luminaries. He opened his paper with the words: "I was invited by many chancellors and many important persons, but I would like to timidly confess the reason I am here is for Giuseppe Cartei, my master". I am telling you this, because we are all proud of having Giuseppe as a member of our Academy. You have seen with what naturalness and synthesis he made years and years of studies accessible to us, along with the fact each citizen wants to know, since we all want to know to some extent – as long as we're not too late – what the effects of certain pollutants are. I would therefore like to thank Giuseppe; later in the conference w e will be talking about the various issues raised. Now we have to papers left: those of Klaus Rudiger Trott and Marino Folin. Perhaps you, Giuseppe, would like to spend a few words about Klaus Rudiger Trott, since he is dear to all of us, but particularly to you.'

GIUSEPPE CARTEI

Klaus is a most distinguished researcher, who combines two thing which are not always easy to combine: being a gentleman and being smart. At the University of London he is studying a specific field, radiobiology. He is an expert on radiation, but also on epidemiology, and only two other persons in the world are at his same level. So, although he is not a Nobel prize winner, he is certainly an important guest.

9th Paper
RISKS ARISING FROM THE NUCLEAR RADIATION OF SUN AND EARTH
[Speaker: Klaus Rudiger Trott]

'I am most grateful to you for inviting me here and using such kind words, which I certainly do not deserve. When awareness of the health risks from environmental pollution first arose, it was mostly concerned with the acute toxicity of the exhaust fumes of steam engines and from chemical processes which were visible and could be smelled, and for which there was direct evidence linking the smog or the chemical plumes to acute or chronic health problems such as respiratory distress or skin rushes. Today, this sort of environmental pollution which causes directly attributable damage to health has become rare in industrialized countries although they are still common in developing countries where economic and industrial progress has precedence over environmental concerns.
In western Europe too, however, we experienced disasters of this kind, as in the case of the smog of London, which killed thousands of people in 1950, or of dioxin pollution at Seveso, just to mention

a few examples. As we gradually learn how to prevent such accidents, or at least to make them highly unlikely, rare accidents, the emphasis of environmental protection is turning to the potential health effects of more insidious pollution with agents and at concentrations which we cannot detect through our senses, but which we can measure with intricate physical or chemical methods. They may cause long-term health damages, and cancer in particular. Yet, the link between exposure to pollutant and the occurrence of health damages is not as obvious as it used to be in the past. Moreover, the lack of direct experience of exposure and its relation to health risks often leads to uncertainty, worry and, in many cases, to panic, which is particularly obvious in the specific case of nuclear, ionizing radiations which most people perceive as a hidden threat to their well-being. What people believe,is that radiations will make them ill. The more visible the pollutants, the less people are worried about the effects they might have on their health. Ultraviolet radiations from the sun cause as many cancers and cigarettes, and yet few people worry about this. There is no proof that electromagnetic radiations, for instance those produced by cell-phones or by nuclear plants, can cause cancer, but many people have done their best to stop or reduce them, although we haven't fought against nuclear radiations enough. Epistemological data exist to measure the health damages caused by these pollutants; they were gathered during long periods of time, and must of course be interpreted and extrapolated with the utmost care.

Research on cancer-causing radioactive pollutants has played an important role, not least because our own awareness changed, and extended to include invisible environmental pollutants. Most of the paradigms, concepts and environmental research methods used were also developed during epidemiological studies. I would like to mention three. Firstly, the professional risk run, for instance, by miners, of getting lung cancer, as a consequence of their exposition to radon and other products. This had already been clearly defined in 1879, 17 years before Becquerel's detection of radiation. This is a model, a comprehensive study on the effects of work-place pollution on human health, including social and medical aspects, and methods of protection. Second point: the risk of developing lung cancer from radon pollution in our own homes, and its relation to lung cancer caused by smoking. No recent and complex studies were carried out on the long-term effects of unavoidable, everyday pollution.

The most comprehensive epidemiological study into the long term health risks from environmental pollution is the study on the survivors of the atom bombs of Hiroshima and Nagasaki which has been following closely a cohort of 120.000 people now for more than 50 years and is still going on, even looking at tens of thousand children of the exposed people. It is not only the principles and regulations of radiation protection that are based on this study, it also set the gold standard for any other study into the long terms health effects from any environmental pollution. I don't want to go too much into detail in discussing these studies on the effects of environmental radioactive, but I would like to discuss some issues which emerged from these studies, and regard the cancer risk. There are several kinds of polluters, be it physical such as UV light or electromagnetic waves (e.g. those associated with power lines or mobile phones) or chemical or bacterial. We can learn something from all this.

The first message is this: Clinical presentation, time of manifestation, even mutation patterns or other molecular changes of radiation-induced cancers, as far as we know now, are not different from those of spontaneous cancers. Since there is no clear proof for the existence of fingerprint mutations, which might follow the cancer-causing agent, we cannot tell whether a certain patient's cancer was caused by a specific radioactive exposure in the past. In the best of cases, for instance in the case of thyroid cancer, we can simply assess the likeliness of the cause, but never the entirely sure of the cause. The latency between exposure and manifestation of induced cancers may vary

between few years and more than 50 (!) years. The latency depends on the age at exposure and the type of cancer. Latency is shorter for people exposed at an older age than for young people, for, in the case of the most common kinds of cancer caused by radiation, new cancers become visible between the age of 40 and 50, after the exposure which took place 10 years earlier. The reason for the length of these periods is unknown, but what it means is that negative results of epidemiological studies after exposure of populations to a potentially carcinogenic agent with a follow-up of less than 20 years are pretty meaningless. What it also means, is that in juridical terms we ought to consider high-level carcinogenic exposure rather than the appearance of the illness, since it might take up to 50 years for it to develop.

The third point is this: the type of cancer induced by exposure to a carcinogenic agent varies from agent to agent. Only the organs directly exposed are at risk: for instance, the skin we expose to UVA rays. Even ionic radiations, such as gamma-rays, those of the nuclear weapons released in Japan, which led to the same dose of radiations attacking all bodily organs, act in a very specific way. Some types of cancer which are common in a normal population, such as lung, colon or breast are very susceptible to induction by radiation whereas others which are equally common, such as cancers of the rectum, the prostate or the cervix, are very resistant to radiation. Moreover, the type of cancer induced by radiation varies dramatically with the age at exposure: the most common cancer after the exposure of very young children is thyroid cancer (while the thyroid of adults is extremely radio resistant); the most common type of cancer occurring among young female adults is breast cancer (yet the breast of older adults is not susceptible to development of radiation-induced cancers). In elderly adults, on the other hand, lung cancer is most common after radiation exposure. The reason behind the specificity of this action is unknown, as is the organ and its specificity, unless the exposure is limited to one or two organs, as in the case of asbestos exposure.

Another result of radiobiological research reveals an even more serious problem for society: some people are more susceptible to the cancer risks from radiation exposure, either due to genetic predisposition or to life style factors. The molecular mechanisms behind the genetic susceptibility to radiation-induced cancer are one of the top priorities of radiobiological research. But they also pose a very difficult ethical dilemma: should we design protection strategies for the most vulnerable member of society, or for the average member of society? Should we exclude susceptible people from professions and occupations where exposure might occur? Should we also consider the practical consequences of this, and take human rights and the rights of society into consideration?

Here is another lesson we have learned: the epidemiological evidence for the induction of cancer by radiation is available only after levels of exposure which are far in excess of those we may encounter in the environment. Even after the dramatic accident in the Chernobyl nuclear power station, the only epidemiologically documented long term health effects from radioactive pollution was the dramatic epidemic of thyroid cancer in those children who were exposed under the age of five – but there was no evidence for leukaemia or other types of cancer. Any attempt to quantify the carcinogenic risk of radiation levels present in our normal environment directly by epidemiological research it futile and doomed to yield ambiguous results without any practical or scientific value. There is one notable exception, though: those people who live in houses where the concentration of the naturally radioactive noble gas radon exceeds 200 Bq/m? have a significantly elevated risk of developing lung cancer which, however, is small compared to the risk posed by smoking. This applies to about 1% of Italian houses. In all other situations, environmental radiation levels from the earth, or the sun, or man-made, are one or two orders of magnitude lower than those which were associated with a significant carcinogenic effect in large epidemiological studies on tens or hundreds of thousands of study participants. An even further increase in the size of the studied popu-

lation, to include millions of people, cannot solve the fundamental problem that the carcinogenic effects of low doses or radiation, and low exposures of other carcinogens cannot be investigated directly. This means that any statement on the health risk of low doses of carcinogens is based on extrapolation from the evidence-based risk at higher doses by using a mathematical equation. Extrapolation assuming proportionality between dose and risk, the so-called no-threshold linear dose response model is very popular in all areas of environmental studies. It was first proposed by the International Commission of Radiation Protection as an appropriately cautious method to optimise planning of radiation protections measures. This is what it is, no less, no more: an hypothesis. It is not based on scientific evidence.

The final lesson we have learned is this: to minimize risks is an important task requiring a comprehensive consideration of all possible alternatives. Concentrating on one kind of exposure alone can be a dramatic problem. I would like to discuss it through a medical example: the treatment of psoriasis. Until about 30 years ago, psoriasis was treated with low doses of x-rays. Epidemiological studies proved that this can cause skin cancer, although the risk is rather low, occurring in about 1 out of 1000 patients. In order to avoid the use of x-rays, the PUVA treatment has been used, a combination of ultraviolet rays. It was introduced and was very successful. Long-term studies, however, revealed the dramatic risks it entailed. PUVA is far more carcinogenic than x-rays: 1 out of 10 patients suffered from skin cancer –including melanoma – 10 or 20 years after receiving the treatment. The risk, however, had been accepted to avoid all other risks; this shows how truly dangerous focusing on one kind of exposure alone can be. Establishing safe levels for radioactive pollutants, moreover, does not involve scientists, but society at large, since it requires scientific knowledge and must not be based on the analysis of costs/benefits, on the comparing risks and uncertain deductions. On the contrary, and as opposed to human-produced pollutants, nuclear radiations from the sun and the earth are inevitable. We can merely modify them within certain limits. There is some proof that excessive radiation levels are a cause of cancer. Most of this proof comes from the exposure to natural radiation; natural does not equal healthy, and unnatural does not equal dangerous. The spontaneous variation in sun exposure can also help define acceptable levels of exposure; this is extremely important, in order to avoid the speculative expression 'safe level'. The term 'safe' cannot be defined, while we can define 'acceptable' in a common way. This argument provides the basis fro the International Commission's warning against radiations. Even if its procedure cannot be directly applied to other carcinogenic pollutants, radiation biology can serve as a model for the general protection of the environment. Thank you for your kind attention."

EUGENIO VASSALLO

Thank you, Prof. Rudiger Trott, for your investigation, which I believe should draw scientists' attention. One claim you made is particularly significant: focusing on one kind of exposure alone is dangerous. Risks must always be compared, but it is better to talk in terms of acceptability, because it is not possible to talk of security. The only question I would like to ask you, Professor, is: you are talking about a IARC minimum dose – I think you stated in your most recent work, that a minimum dose does not actually exist – does this minimum dose not exist because a single kind of exposure cannot be measured in the context of a series of polluting, cancer-inducing factors?

KLAUS RUDIGER TROTT

I hope to have understood your question. A question about the effects of very low doses is not actually a scientific issue, it is an issue of perception. There is absolutely no way of defining a minimum harm-causing dose. This is well beyond our scientific means.

As for radiation, we are lucky enough to possess environmental standards. The doses we are all exposed to are different: no one receives the same amount. The standard deviation of this distribution equals more or less 30% of the medium level, and was defined by the International Commission for protection against radiation as an acceptable level for the general population, since no one takes care of these things. We actually don't know whether or not any effects occur, at least it's not something we think about, or something we try to keep in check. This is a practical approach, which I believe might be applied to other areas of environmental protection as well, to define acceptable levels. I don't want to talk about secure levels, since this is impossible, or non important and non significant levels, because we can't; I am talking about levels which we shouldn't worry about, or spend too much money on which might be spent to deal with pollutants which surpass this level of uncertainty.

ANTONINO ABRAMI

Let us continue our papers with our friend, Chancellor Marino Folin, who honoured us by joining the Academy as a founding member. I can tell you now that by 7 pm the boat for the Des Bains is leaving, so we'll be having our dinner. Unfortunately, given the late hour, no debate will take place tonight. I would like to thank you for waiting until now and for your enduring kind attention. Your turn to speak, now, Marino. You require no introduction, Folin.

10th Paper
SUSTAINABLE URBAN DEVELOPMENT: PRESENT AND FUTURE
[Speaker: Marino Folin]

'As I will be the last speaker for today – something I am not particularly pleased of – I will try and be as concise as possible. Although I am the last speaker, I would also like to thank Nino Abrami for his work, for I believe that all those who, like me, followed it from the very start, will agree on the fact that without his almost reckless enthusiasm and stubbornness – and I should add that no one expected him to really go ahead with the project –, this initiative would certainly not have worked out and we would not find ourselves here to discuss things now. For this, I think we all ought to be grateful to Nino. What I wish, is for the project to continue and develop more and more; as far I'm concerned, I'll do my best to collaborate with him.

The issue I would like to focus on, stands out from the ones before, for what I will be discussing is the chief accused party in giving way to those risks and destructive environmental phenomena we have discussed today: cities. The existing subject of my paper is the 'Urban sustainable development, present and future'. Firstly, I would like us to all be aware of the fact that when we talk of sustainable cities, we are not talking of a mere qualification to be applied to existing cities. The existing city, as we live it, should be made more sustainable. But it is not so. The issue of sustainable cities involves another issue: the development of a radically different concept, a radically different way of thinking about the city. It is completely different way of planning cities. I will concisely develop this theme along five bullet-points.

The first point is this: this is not the first time that man is concerned about the negative effects of cities. The means we have today to analyse the urban phenomenon, and the means to intervene and govern it arise for that first idea, that first rejection and perception of the city as a sick city which

arose in the mid-XIX century through a series of enquiries, mainly conducted by hygienists. It is this hygienist movement which draws attention to the problem through a series of enquires focusing on the issue of housing, starting from England, and spreading then to America. Authors like Ceduic and Charles Butz emphasised the fact that the city, as it was then developing, was a cause of serious pathologies. From this first approach, the means of governing a city as we still know them developed.

Contemporary urbanism developed in the mid-XIX century on the basis of the analysis carried out by hygienists. What was their answer to the problem? A series of city-recovery projects, the demolition of slums or their recovery, the creation of modern technological networks, ranging from sewers to aqueducts, and a way of conceiving of cities in terms of different functions: functionalist, zone town-planning. Town-planning known as rationalist town-planning, which was mainly developed in the 1930s, was born in the late XIX century on the principle of functionally isolating the polluting and dangerous parts of a city. The functionally-planned town has housing areas on one side, productive areas on another, and commercial areas on another still. It constitutes an attempt to deal with the complexity of cities by separating, and isolating, their different parst. This first approach certainly helped solve some problems, but it also gave rise to others, and proved incapable, in the long run, to deal with the urban phenomenon as it came to develop. Bear in mind that its very idea is that of isolating productive areas from the rest because they pollute, which constitutes an actual acceptance of these polluting areas. This is the very principle at the basis of Porto Marghera, to turn now to our own problems: the utter inability to consider the fact that it is no good trying to isolate a problem which cannot be isolated, and must be solved at its root. This is something town-planning, rationalist and functionalist town-planning, did not take into account.

The second point is this: this very system, its means of analysis and all its governing tools for the urban phenomenon prove useless for solving the problems which ought to be solved. Where does this crisis arise from? It follows from my previous observation of the fact that its very formulation is radically wrong, and from the fact that the phenomena this kind of town-planning was expecting to control are actually uncontrollable because of their size: cities, in many parts of the world, reached unimaginable sizes, with 11 or 20 million inhabitants. Because of their unimaginable size and the speed of their growth, any prediction made through town-planning methods of urban sprawl control is useless. Even if such a phenomenon has not assumed the dimensions one can find in countries other than Italy, and urban development is rather limited by a relatively reasonable population, the phenomenon of urbanization has taken place in very recent times.

A third point concerns the various ways in which the phenomenon of urban development takes place. On the one hand, we have huge urban complexes of up to 20 million inhabitants; on the other, a phenomenon known as the 'spread city', a kind of urban sprawl by which the city spreads, absorbing and destroying the land, with a low density of population, but a high level of urbanization. When we talk about cities today, we should always bear in mind that we are using the term 'city' in an inappropriate way, for it has nothing in common with the ancient phenomenon of cities. We are also mistaken in talking about 'civic centres' and 'suburbs', for the two are now part of a single phenomenon, which it is hard to describe – whether in terms of metropolis, metropolitan area, or agglomeration –, by applying standard forms of control to what is now a very different phenomenon. Perhaps, the term 'agglomeration' might be the most appropriate. An agglomeration which – and this is another reason why the traditional means used by town-planning are undergoing a cri-

sis – does not manifest itself in the form of civic centres and suburbs, of an organism governed by rules of organic symmetry, but in a chaotic fashion, like a scattered network of fragmented junctions, with no hierarchy, no order, as a chaotic whole in which different functions overlap or are divided. In this case, traditional urban intervention might cause greater damages rather than solve the problem, or at least only solve a small part of the problem.

The third point is the problem of communication. All of Cartei's speech was centred upon this very problem, the problem of the chaotic agglomeration of cities, with the characteristics I have tried to summarise, which threatens humanity's survival. This might sound a little extreme, but it is a fact, unless we control the situation. We are facing an absolute paradox: humanity, at its present level of development, finds its living condition in an urban form, outside which it cannot live. Development is urban development, and yet, at the same time, this agglomeration stands as a threat. This a paradox, a kind of oxymoron. The city we live in is a cause of (air, water) pollution; it uses and wastes precious resources, causes stress in its inhabitants, and a range of illnesses. We were talking of pollution-induced cancer before: I think it might be worth looking into the phenomenon of stress-induced cancer. Bear in mind that this is what affects the inhabitants of the city; various measures exist, such as the limitation of traffic circulation to odd or even number plates, to allow our survival until we find radical solutions. These negative phenomena, however, are not limited to city dwellers alone. The ozone layer and the general climatic conditions of the planet are threatened by the cities, and by what they produce, not only within the cities themselves, but outside them as well. The local phenomenon gives rise to global effects, and this is a fact.

The fourth point is our attempt to answer the following question: given this situation, how can cities achieve sustainable development? We have little time left, so let me be as concise as possible. Two philosophies attempted to deal with problem: the first one, which is still referred to at times, attempts to apply the theme of sustainability to some forms of regional planning in Italy and elsewhere, as one sectorial policy among others. An attempt is also made to assess the environmental impact of transport, mobility and productivity policies. It doesn't affect any of the modes of interventions in the city, or any of its development principles, but subsequently checks and evaluates the situation, while leaving the whole conceptual system of sectorial policies within the city untouched. The second system – and this is the path we ought to follow – avoids thinking about sustainability as one sectorial policy amongst others, but to extend it to all our methods of town planning. This is the path to follow. What we should aim for is the overcoming of divisions within sectorial policies. We ought to start having an organic view of planning policies, for adding policies to other policies – commercial, productive and mobility planning – is not going to solve the problem. What ought to be overcome is the sectorial approach to planning, in such a way as to place the problem of sustainability no ex post, but ex ante the problem.

Fifth point: which are the distinctive, general traits of the planning process? How is this process defined? I will try to schematically summarise the issue. The first point is the issue of territorialism, i.e. placing each specific location at the centre of our attention. What territorialism means, is to avoid imposing external abstract models, and to start from the land itself and from its needs in our attempt to find answers to the problems affecting it. One cannot leave the land, and its limits – administrative rather than physical limits -, aside. The second point in this issue is, as I previously mentioned, the integration of the various sectorial politics. The third aspect concerns the interdisciplinary approach: no planning action takes place today which is not interdisciplinary. Rightly enough, this

is one of the main issues at the basis of the Academy. A fourth point: the plan requires a constant participatory communication, which, as someone mentioned this morning, is a basic democratic principle.
These are the points which ought to interest any planning action. If these are the points, the first keyword is 'identity'. We ought to know each place, its needs and configuration, both in natural and in human, historical terms. This is essential, must provide the basis for any plan of action. The second point here concerns human settlements: we cannot use scattered models. The original city was a dense city, so what we ought to consider when dealing with urban planning is the densification of cities. By densification I do not mean allowing vast empty areas within the city, but aggregating human settlements, in such away as to avoid them scattering and invading, so to speak, the surrounding landscape. Urban centres should be integrated one with another. We probably ought to think in terms of a rigid articulation of the various, distinct areas. We probably ought to return, so to speak, to the medieval city, so to speak, because we are also facing a problem of radical revision of our mobility and human and cargo transport models. With strongly scattered cities, we are forced to employ private transport. A revision of town planning based on our transport system entails a densification of the city, which will have to be provided with a significant network and juncture system. This is the model we have to strive for.

The third issue involves the use of resources and the closing of cycles, that is to say: we need to locally make use of local resources. We cannot possibly plunder external resources, or export negative externalities. This leads us to a fifth point: a radically different view of the establishment of the general conditions, the system of infrastructures, on which a city is based. The problem of energy production, for instance, which is one of the major causes of pollutions, and is connected to issue of the closure of the cycle, should be solved through the use of renewable, flexible and alternative resources, which depend on various means of energetic production, which take local conditions into account, other than the vast areas of energy production for the whole country. Closing the cycle means using local resources without exporting any damage, which ought to be solved without wasting the existing resources. This is in some respect how new plans, such as that for the optimum territorial areas (IATO), are trying to solve the problem.

Let me end. The issue of sustainable cities requires a radical revision of the means by which we conceive of cities and govern them. this is one of the missions of our age: we need to rethink the contemporary city, in the same way as this has been done in the past, in the late 1800s, when emergencies such as those of slums, pollutants and bad sanitary conditions, were solved. This is the great mission which faces us, and this is the way we ought to approach the issue. What is required is not a general regulation plan, but a general vision and project, in such a way as both to conceive of the development of a specific area as a guide for local action, with the use of existing and renewable sources, and the identity of the place, in mind, and to develop forms of participatory knowledge. Because without this we will never be able to develop grand plans, which are implemented by a myriad of ant-like individuals like us. Without this active knowledge, and this distribution of participatory knowledge, the results will always be negative'. Thank you.

ANTONINO ABRAMI

'Thank you, Mario Folin, also for the kind words you used about me. Knowing how heartfelt they are, I can truly appreciate them. Unfortunately, it's late now, so there's no more time left for either debate or conclusions. We will make up for them tomorrow. Daniela fixed a strict schedule for us:

at 7 pm the vaporetto is leaving, and we'll be having dinner at the Des Bains. Beside those present, I would also like to thank the interpreters and all other collaborators. Thank you. Tomorrow, we'll be leaving the Des Bains at 8:30, for our first paper of the day: that by Michel Ebner'.

If consent can be measured by the participation of those present, and by their observations, whether critical or not, the conference certainly did not fall short of our expectations.

24 OCTOBER 2003
ENVIRONMENT, CULTURE, INFORMATON AND TECHNOLOGIES
Morning

Part 3
THE ROLE OF PUBLIC ADMINISTRATION AND THE MEDIA

Neither the bad weather (cold, wind and acqua alta [flood tide] on the first day), nor the announcement of a national strike on the second day (24th of October) kept the judges,[12] lecturers, journalists, students, researchers and private citizens from attentively and continuously following the Conference on its second day, when it focused on the theme 'ENVIRONMENT, CULTRE, INFORMATION AND TECHNOLOGIES'.

In the morning [Part 3 of the programme], part of the day's work focused on the ROLE OF PUBLIC ADMINISTRATION AND THE MEDIA - with papers of great interest, such as the one on the E.U. policy for the protection of mountains,[13] the one on biodiversity,[14] the one on the role of the

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[12] *Members of the High Court (Giovanni Salvi), Judges of the Supreme Court of Cassation (Raffaele Raimondi), the first magistrate of the Venice Court of Appeal (Giovanni Massagli), councillors of the Venice Court of Appeal (Giancarlo Scarpari, Umberto Mariani, Alessandro Apostoli), court judges (Councillor Roberto Beghini), Public Prosecution magistrates of the Supreme Court (the substitute general attorney and founding member of the Academy Riccardo Fuzio, the first magistrate of the Public Prosecution District of Venic Ennio Fortuna, and the magistrates of the Public Prosecution office of Rome – Pietro Saviotti – and of Vicenza – Giacomelli).*

[13] ***Speaker: Hon. Michel Ebner, Europarlamentary***

The eminent speaker stated:

'Dear president, ladies and gentlemen: I would like to thank you all for inviting me to this International Conference. I hope the messages delivered from Venice in these days will be both hared and accepted outside; I am confident that this will happen, for the high level of the conference can be easily told by its program. I am particularly grateful to Prof. Antonino Abrami for his work, his effort and persistence in the field; I am confident that thanks to his energy, we'll be able to discuss these things in the future as well. The issue I will be discussing is "The protection of mountains and the European Union policy". This is an issue the European Council might discuss with relatively few words. The fact is, the European Council never officially expressed itself, through documents and resolutions, on mountains. The Parliament and Commission discussed the issue several times. In 1975, the Commission passed a directive in which mountains are discussed in terms of mountain agriculture, and not of living space. Things changed in 2002, when the 'Year of the Mountain' was organized. Throughout this year, the European Commission organized several meetings, and attempted to gather all the ideas developed in the course of the many events taking place in all the European Union, in order to channel them in a meeting, which took place last year, in October, in Brussels. The two commissaries for agriculture and regional politics Fishler and Barnier, both coming from mountain areas. We who come from the mountains, from northern Italy and the central Alps in particular, might say we have two lobbyists within the Commission, two sympathisers: the vice-president Lojola De Palazio and President Prodi. Prodi not only because he skies and cycles in mountains, but because he truly believes that the policies surrounding mountains ought to be changed.

The Parliament only discussed the issue three times: in 1983, the Colleselli report – Colleselli being a European parliamentary from north-eastern Italy, from the Veneto – when the Belluno area had been hit by a flood; then with the report by Santini, another Italian parliamentary from the north-east, from Trento, who had issued a report about the needy areas, including mountainous areas. In 2002 the Parliament entrusted me with issuing an official report on the 25 years of application of the 1975 report; given the fact 2002 was the 'year of mountains', this became both an evaluation of what had been done, and a report on what the policy of European Union for mountains should be. What this involved, was a wide discussion, primarily on the need to broaden the scope of the report. At one moment we didn't know how to proceed; the governing body wanted to withdraw the report on the basis that it hadn't stuck to its given theme, that it was meant to be an evaluation of what had been done and not a formulation of prospects for the future. After heated discussions, in 2002 – the International Year of Mountains – we understood that it was politically wrong to discuss the issue in such way.

You should know that the European Parliament considers islands and periphery areas particularly 'needy areas'. Although mountains have similar characteristics to periphery areas, these are influenced by altitude and not closeness to the pole; and yet, the issue of mountains is little discussed. The reason for this, is the fact that only 10% of the European Union population lives in mountainous areas. One should also consider the fact that the enlargement of the European Union entails an increased interest in mountains, and

that mountains play an increasingly important role in relation to the flat country. Here are some figures: about 30% of the surface of the European Union is mountainous, although we still don't have a clear definition of what a mountainous area consists of. This clearly shows how we have just begun trying to find a common denominator for mountains. The European Commission is working on the problem: it was meant to produce a document at the beginning of the year, but it hasn't yet managed to. I hope that before the end of the Commission's mandate, it will present the proposal both to Council and to the Parliament.

As you can see from the slide, 10% of the population of certain States members of the Union, such as Italy, Spain and Austria, live in mountainous areas. We are facing serious difficulties within the European Union, in terms of governance. We have rights, and community, national, regional, provincial and local jurisdictions which overlap. What we lack, as I just mentioned, is a homogeneous definition. One of the primary objectives of the European Unions from this point of view, is to reduce the imbalances found in the general, and agricultural, production, as well as the other social and economical imbalances.

Mountains are – and this was defined in the report which was broadly accepted by the European Parliament – a common good, not something which merely interests those who live in the mountains. Mountains are of interest for all the community, and 90% of the population which is not living in mountainous areas gain various benefits from the conservation of the mountain ecosystem. Just look at the abandonment of mountains, for instance in certain areas of Veneto, but especially in Piedmont and Lombardy; in the case of the Alps, the biggest massif of Europe, the abandonment of the mountain on the southern side, that of Italy, is significantly more advance than that on the northern side. This abandonment is a primary cause of degradation, something we documented in a frightening way during the flooding of areas of Piedmont and Valle d'Aosta.

The report focused primarily on mountain agriculture, since, as previously mentioned, until now the European Union has viewed mountains as an area of food production. In the future, I believe agriculture should be valued for the direct contribution it provides in the prevention of natural calamities, the protection of biodiversity – an increasingly important factor –, the safeguarding of the land and its diversity as a something valuable both for tourism and consumers. The European Union is seeking to establish a comprehensive future strategy for mountains and ecological compatibility. It established the seven sectors you can see on the slide. These are all important points, and often a cause of disagreement, as in the case of the transport issue: transport is important in the for of the cargo transport, as in the case of the Brennero area, which is closer to us and has a negative impact on the environment. Consider the fact that 1.200.000 lorries pass over Brennero ever year. Transport, however, also allows one to reach the valleys; without it, abandonment would follow, and degradation would follow abandonment. We have witnessed this in the province of Bolzano, a small province, where transports were organized in the 1970s, not least through the contribution of FEOGA, in such a way as to provide even the furthest valleys with acceptable roads and public transport, and prevent abandonment. Even in these far-away valleys, it was possible to establish tourist facilities and small craft industries, in order to tie the population to the land and provide a little economic well-being, which is essential. A new road is always a scar for the environment, but a smaller one than the one caused over time by abandonment.

I believe that the future management of natural and water resources will play an increasingly important role. In the past, we have always taken energy resources rather than water resources into account, which is something we ought to be well aware of. This issue goes being the scope of my paper, but it is closely connected to it. It is parallel to it, in the sense that the European Union shows a great interest in turning water resources into a matter of national, if not community interest. What would this entail? It would entail the member States first, and then the European Union, and no longer the various municipalities, provinces and regions, dealing with water resources. All this for the reason that the vast majority of the EU population uses water which has been processed with the adding of chlorine and other purifying substances, while many water resources are not used for this purpose. But if we take these resources away and gather them in certain areas, as Vienna does – Vienna uses water it carries for about 40 km through drinkable water aqueducts –, the water of our Alps will be brought to Milan, Munich, perhaps even Frankfurt. This, however, has a significant environmental impact, and is a factor we ought to take into consideration, when dealing with the general strategies for the alpine world, i.e. for mountainous areas.

In the future, we ought to have several strategies; this certainly is an inter-regional, trans-boundary issue. You are no doubt aware of the fact that the Alpine Convention is something great, but if the EU States don't ratify its protocols, it has no value. This is big problem: it is not only individual States which won't assent, but the European Union itself, its Commission, removed its officers from the conferences. They no longer send representatives and sign protocols; this choice of commissioner Walsmer of the Commission is utterly unacceptable. We are now working to export the model of the Alpine Conference: similar areas outside Europe have shown a greater interest than the European Commission itself, and this is incomprehensible. Unfortunately, the national government has not yet signed the transport protocol, and it would seem like it is changing its mind. I think this might cause a considerable slowing down, given the fact that the transport protocol, one of the 11 protocols, is the most important for us. I hope things will change.

Strategies must of course be coordinated. Not only from the point of view of an inter-regional, trans-boundary collaboration, but also in different situations. The degradation of the central massif in France, for instance, is problem which might be solved thanks to our experience with the central Alps. I believe that it is important to establish a network, as the European Parliament, and the Commission, suggested. Many solutions have been suggested, discussed, and partly implemented. I would rather not focus on each single measure, but rather show them to notice the unique situation one can observe within the European union. The reform of agricultural policies which is underway directly affects mountainous areas. As you may know, in the year 2000 we missed the chance of implementing an agricultural reform, because of France's intransigent stance. The only agreement reached, that of Mittern Briviù, was implemented not for political reasons, but because of the many scandals which happened between 2000 and 2003: foot and mouth disease, BSE, the

chicken scandal in Belgium, which led to a strong pressure at the hands of consumers. For this reason, this summer a reform of the agrarian policy was implemented, not in a hurried way, but quicker than usually. Unfortunately, no specific provision was made for mountains. Many measures exist concerning mountains, to favour those who till the land; not to provide direct support for the products, but to provide for producers, the protection of the land and family-based enterprises. In such a way, since the size of agricultural firms is rather small in some areas, many of these new regulations help agricultural workers in mountain areas. Other activities should be strengthened as well. As you know, the European Union does consider tourism one of its policies, and as far as craftsmanship and industry is concerned, the safeguarding of certain specific activities is far less taking into consideration than the competitive element, which is one of the most important issues.

I would like to end my paper by mentioning the fact that the European Union has only recently started to conceive of mountains as something other than mere areas of production. We are only at the beginning, then, and I believe that the discussion on the Convention of the Intergovernmental Conference might help us take a step forward.

I mentioned the problem Wednesday evening in the European Parliament, which met at Strasburg, during a discussion on periphery areas and island. Minister Frattini was present; as the President in charge, he was discussing these issue. I intervened to ask him whether mountains should also be included in the current debate of the European Union about needy areas, along with periphery areas and islands. We should not take Selva Val Gardena or Alta Badia as examples of mountainous areas – and I am here talking about my own home; they certainly are mountainous areas, but they don't need any support, since they have reached a high standard of living and economic prosperity. Many other mountain areas, on the other hand, require some kind of support. The current President of the Council of the European Union, Frattini, declared that this is one of Italy's requests. We shall see. You are probably unaware of the fact that that E.U. States presented 420 pages of proposals at the Intergovernmental Conference, to change the text of the Convention on the constitutional treatise. Discussing 420 pages of changes and amendments will be a never-ending task, so I only hope that the Italian presidency, which has so far shown a positive conduct in this respect, since it avoided coming up with suggestions of its own, but attempted to cautiously mediate others' proposals by providing clear ideas, will also discuss mountains at the Intergovernmental Conference. This would be a significant improvement; I hope it will take place. Thank you for your kind attention.'

[14] ***This is the speech held by Dr. Gomes, of the Nature Conservation Service of the Ministry of the Environment:***

'I would like to thank the President and all those present. I am here as a representative of the Ministry of the Environment, and have been working on this issue for ten years. I would especially like to thank the organizing committee, which invited me to take part at this working program on the national plan. Allow me to observe, that the term 'national plan' is somewhat outdated. What we ought to devise are national programs, not a national plan, in relation to biodiversity. What I will be discussing are programs, not the plan. My paper will revolve around three main points: this brief introduction aside, I will discuss the characteristic and structural elements of the convention on biodiversity, the origin of the term biodiversity, and finally the implementation of the Convention in Italy, and future programs.

The term 'biodiversity' was first suggested in 1986 by Walter Rosen. This was a particularly exciting moment, both culturally and intellectually, at an international level, and Agenda 21 was in the process of being developed. This is one of the foundations of sustainable development, the chief subject discussed at Rio de Janeiro, when, along with the Convention on biological diversity, climate changes and desertification, the Agenda 21 will be presented. The Agenda is a body of 40 articles, which suggest forms of development for the 21st century. Eduard Wilson and France Peter published a work on biodiversity, thus providing a definition of the term, but it is its Rio de Janeiro follow up which sanctions the actual value of biodiversity.

The characteristic elements of biodiversity consist of two parts: firstly, what are its objectives? The conservation of diversity, or biodiversity, deals with the conservation and use of all species of flora, fauna and micro-organisms on the planet. The sustainable use of its components, i.e. of these species of flora, fauna and micro-organisms, implies their use, not a mere protection, in such a way as to safeguard their genetic and productive value. This leads us to the third element: the ecological use and distribution of benefits. The idea of sustainable use is little well-known. It is often erroneously thought that sustainable use means non-use. Actually, the convention on biodiversity emphasizes the idea of use, but not the complete removal of the genetic elements which compose biodiversity. What the use of genetic resources implies, is their connection to specific activities. On the other hand, genetic resources are employed for feeding, for social needs, and not for merely maintaining something without making any use of it. This leads to a whole series of activities, ranging from education to a complete safeguarding.

The second element is the eco-systemic approach. Why am I talking about an approach here? Because the eco-systemic approach represents a strategy for integrated administration. The term 'integrated administration' describes the place of man as the leading figure in the administration of the land. We ought to imagine this talking place on three different levels: goods (i.e. biodiversity, the ecosystem in general, social demands and social needs), feeding and the use of technology, the way in which one can maintain what has been offered to him. In the overlap of these three areas, which we might imagine in the form of a Ven diagram, we find a central nucleus, which is the eco-systemic administration. We are then talking about high responsibility. Second element: by the term 'ecosystem' we mean the dynamic complex in which plant, animal and micro-organism communities interact with functional unity. Here we are getting back to the idea of paying attention to bio and geo-chemical cycles, not as they had been described and illustrated in other forms, as something natural, but as governed and controlled by the presence of man.

We are here approaching structural elements. We were talking about the central nucleus of the Convention on biological diversity. The convention was signed by 186 countries, and came into force on the 29th of December 1993. This was the first convention to be enforced. In 1994, a year after, the first conference was held. What did the conference, as a political and judiciary organ, decide? The working programs. It offered suggestions about the resolutions each country should apply. The Convention consists of 42 articles and two annexes, which offer no precise guidelines. This makes it hard to understand, to the point that the Convention on biological diversity established another element, which isn't at first obvious: the fact that only specialists – taxonomists, geneticists, fauna researchers, botanists – can discuss the methods employed might be taken for granted; actually, the order of the eco-systemic approach to the method, to the use of genetic and other resources is intellectually subverted where there are specific social and economic demands. The comprehension difficulties of this Convention reside in the union between the specialist and something which, to get back to what Prof. Abrami was saying, consists in a far more holistic vision than anything strictly specific. The 146 resolutions issued so far were adopted by the conference, and we are now preparing a new conference for February 2004, which involves a whole series of documents which must be acknowledged.

All the subsidiary organ does, is recommend work plans for the various ecosystems, according to a specific order. It recognizes ecosystems and the various themes, which interact as common elements, to define programs for work. What has Italy done? It has been rather prompt in its urging to recognize the importance of the protection of biological diversity, and proceeded immediately with a ratification law. Consider the fact that in December 1993 the law Italy passed had already been enforced. It was also quick – and here lies the proof of the cultural interest Italy wanted to show – in its approval, two months later, on the 16th of March 1994, through a CIPE resolution, of 'The strategic lines of action and preliminary program for the implementation of the Convention on biodiversity in Italy'. What does the CIPE resolution consist of? The CIPE resolution defined 5 general elements: the completion and the evaluation of our knowledge in the field of biodiversity, and the issuing of a preliminary reference report, with a possible draft of the national reports.

The second line of action consists in the definition of an international reference picture, where to outline a hierarchy of values. The international debate is most important, because it provides the basis for a first discussion, which must be acknowledged, among European countries, as something directly connected to the European Union, in such a way as to then suitably acknowledge them at a national level. The international reference picture is provided by the very debate which defines plans and programs, for biodiversity is something common to all, it is not something of no interest for us outside our national and geopolitical boundaries. Why did I recently mention the term 'trans-boundary'? Because nature knows no geopolitical boundaries: luckily it doesn't have similar conflicts. It has other conflicts, in the fight for survival.

The problem of international reference points is extremely important. At the present moment, we are evaluating the impact of climate changes on biodiversity – this will be part of the agenda of our next conference. What this means, is that climate change, which is not an exclusively Italian problem, but something we are 'importing', is both a national and international issue. The community will be significantly enlarged.

The third general line of action consists in the evaluation of species-conservation programs. Such program evaluation is a constant action carried out by the scientific organ, the conference, in such a way as to define new programs. Next month, for instance, the scientific organ will assess a recommendation of a work programs on mountains, which recognizes its eco-systemic value, energetic role, the value of hydro-economy, of waters, and the role of local communities and of women in particular in maintaining traditions. It is a relevant program, dealing with common problems. A program about protected areas will also be discussed. The conference and the international system are gradually advancing, with the need to define an international point of reference. Events such as this, in which it is possible to present and discuss international progress, in order to turn in to a common heritage of experience, are most welcome. The fourth element I should mention are training and education programs. Training for what? In our own universities we can see work programs where environmental sciences finding a place. The problem of professional training is a significant one. Education is when we recognize certain values and define some analytic moments.

Institutional measures and the definition of periodical assessments and strategies. I would fist like to explain why the national plan is obsolete: because, thanks to this international progress and these debates, nothing remains still, but everything is in constant evolution. Consider, for instance, 1994, when the CIPE resolution was passed, but no conference was organized and no decision was reached. Today we have 146 decisions, which require at least an updating of what needs to be defined. What had the CIPE resolution defined? It had defined these new areas of research: knowledge of biodiversity and monitoring the conditions of biodiversity. We might want to spend some more time on this. Monitoring: we have seen, and we constantly see, how the monitoring system described in publications dealing with the state of the environment, or published by the Environmental Protection Agency and similar monitoring organizations, is never homogeneous, and lacks common marker. That of methodology is another issue which is being discussed: what are the means used? What are they used for? In order to communicate with the world outside, how can we carry out a form of control and review our program – to get back to the problem of education? Through local conservationism. This is the origin of the new program for protected areas, which is being implemented these very days. This CIPE resolution, which was issued in 1994, even talks of biotechnologies and security at point 8, both of which were still faraway problems. Now point 8 has changed thanks to the reforms the European Unions carried out in elation to genetically modified organisms: the 1990 resolutions were revised, and the Convention on biological diversity can claim to have brought the Cartagena protocol on the control of the movement of genetically engineered organisms to an end. Here we get back to the trans-boarder problem. This is why all actions, within the structure of the Convention, must constantly be revised, changed and updated.

The Convention invites its side to adopt a national plan of action, a plan for strategic action; it avoids suggesting anything too specific, but discusses an organic plan. Thanks to the CIPE resolution, the Ministry of the Environment carried out a series of actions. In 1997 the Academy of the Forty presented a draft entitled: 'Biodiversity- the Italian plan: to know, use and preserve it'. The draft was presented by Minister Ronchi; after a number of observation were made by people according to whom the draft did not specifically address the issue of biodiversity, it was laid aside. The national plan for biodiversity, as it had been drafted by the committee, had mostly avoided mentioning the decisions and work programs which the conference had elaborated. The project came to a stop when Hon. Bordon took the place of Hon. Ronchi as the new minister. However, we continued to work on it with the Italian Botanical Association. We started by promoting a form of awareness, by monitoring the level of biodiversity in Italy: starting from year zero, we try to develop new programs on the basis of what we have.

What is the reason for these three approaches? There are at least three critical elements. First of all, we can interpret biodiversity in three different ways, in accordance to what has been said so far: the first is the academic level, through official scientific publications, which define biodiversity in a specific way, and in relation to a circumscribed environment, in accordance with Odum's definition of biodiversity as a wealth of plant and animal species and micro-organisms. At a European level, we find two other interpretations of the term. Habitat Resolution 92/43 defines biodiversity in relation to specifically protected areas: this is a narrower view. The protected areas situation in Italy is rather unique, because in the Mediterranean we have a wealth of protected areas, whether humid or coastal areas, national parks or nature reserves. We have many kinds of protected areas, including the new geo-mineral parks. This is a rather unique, and typically Italian, kind of wealth. The Habitat resolution's definition a series of habitats in a specific, and strictly naturalistic way, does not reflect our own definition of biodiversity, which includes the idea of wealth, of genetic resources and of their equal distribution. The Habitat directive does not mention these things.

We have seen how, in the European context, the Pan-European Strategy, which, unlike the Habitat resolution, makes use of the terms 'biodiversity', connects it to the idea of landscape. Why is this? The reason is that landscapes, as well as having a structure of their own, are also endowed with a cultural element, and have been modelled by man as well as by nature. This has been the European strategy. Unlike the Habitat resolution, which was drafted by the European Union, the Pan-European strategy is guided by the European Council. In the year 2000, it also presented a convention on landscapes, associating the idea of biodiversity with that of landscape, naturalistic and cultural elements. We then have the international level, which I have just illustrated. Given these three levels of interpretation, we are likely to be confused about the meaning of biodiversity or, worse still, of the national plan. Where this leads me is to stress the fact that biodiversity programs are more reasonable than anything which is very rigid. The reason for this is little knowledge of the Convention itself, that is to say: of its objectives, goals and programs in particular. Clearly, we ought to refer to its decisions, since Italy, which ratified the Convention on biological diversity, is also called to provide the secretariat with a national report on the Convention. We have already issued two national reports. The first was an experimental one, not only for Italy, but for all other countries as well, since there was no organic method of presentation for our knowledge of biodiversity in the contracting countries. We provided a prompt answer, by re-proposing all the answers which had been provided and which referred to biodiversity. For example, the very law on protected areas is no doubt a clear and strong answer, drafted in 1991, before the presentation of the Convention. Italy was never behind, neither mentally nor culturally. Our main effort is that of aggregating and establishing a common language and a way of sharing common values.

The second national report was drafted by the Ministry, in conjunction with agencies, scientific academies, environmental associations and all those working on biodiversity, so to speak. Here too we became aware of the interpretative level. It is for this reason I mentioned our critical state.

In relation to this process, we decided, after much pondering, to entrust the Italian Botanical Society with providing an overview of the situation and presenting all the new elements, starting from our knowledge of biodiversity in Italy. Concerning the history of conservationism in Italy, and international conventions, i.e. all those elements which interact, I mentioned the Convention of the Alps, but might want to add others, since the Habitat directive, for instance, has its origin in the Bern Convention, the Convention on wildlife in Europe. The Cites Convention, on the control of endangered species, is also worth mentioning, along with the Bonn Convention on migrant species, which is particularly relevant to Italy, a land of migration for many animal species.

The Convention on biological diversity assumes a general interest since it acquires all the heritage of past conventions and turns it into one corpus and single vision; here arises the need to provide an exact definition of the term 'biodiversity'. In relation to our knowledge of biodiversity, the forest and agricultural ecosystem aside, of environmental qualities and ecological networks, we recognize the value of this web, which can be established and defined in specific areas at a national level. The concept of monitoring and conservation of a site plays a central role: in the sixth part, 'monitoring and conservation', methods of control and census are defined. This is what we are trying to optimise, by finding a new shared language.

The plan allowed us to formulate program hypotheses, which are bound at an eco-systemic level. We have identified various levels, and on the basis of this knowledge, work plans will be suggested, but not by the Ministry for the Environment. This is the last part, the possible hypothesis for intervention plans. Among the common elements of these intervention plans we find monitoring, re-qualification, environmental planning , control of soil changes, intervention plans for the conservation of humid environments and internal waters, intervention plans for agrarian and forest systems, intervention plans for changes in the environmental territorial network. All this will only come about through a common work carried out with the various regional administrations. I might refer here to stake holders, vested in this case not only of economic interests, but of social interests as well. Thank you.'

Magistrato alle Acque of Venice in the protection of the lagoon[15] and those on the protection of art-

[15] ***Speaker: Dr. Maria Giovanna Piva, President of the Venetian Magistrato alle Acque. Dr. Piva stated:***
'Good morning, gentlemen. I am engineer Piva, president of the Venetian Magistrato alle Acque. I am here, at this session focusing on public administration, to talk about the institute I am head of, and of its historic activity, so to speak. The Magistracy's constitution was established in 1501 by the Venetian Republic, which united several magistracies, both legislative, decisional and operational magistracies, concerned with the lagoon of Venice and its drainage basin, with both sea and fresh water. The Venetian Republic was aware of the particular fragility of the lagoon environment, and of the need to take the most appropriate and cautious decisions to guarantee its survival.
The Magistrato alle Acque continued to operate until the days of Napoleon, who closed the Magistero, along with the ecclesiastical orders. To face the need for an administrative body with a single view on both fluvial and lagoon waters, the Italian Republic re-established the Magistrato alle Acque in 1907. Why was the Magistero established in the first place? To protect the lagoon, which, in its peculiarity, is an extremely unstable environment, constantly finding its own balance to avoid turning into either sea or land, a risk it runs when either fluvial sediments or sea currents prevail. It was necessary to take some steps to protect this delicate environment. The lagoon we now see, and which people claim to be an amazing natural environment, is actually an amazing environment which was artificially protected by taking bold decisions.
If we look at these two maps, we can see the lagoon of the northern Adriatic on a sixteenth-century map, ranging from Istria to Ancona. This modern map, instead, only shows the lagoons of Marano, Grado and Venice: all other lagoons have disappeared, because they have not been protected in the same way as the lagoon of Venice was. The most important decision taken for its protection was that of Cristoforo Savadino, a technical official of the Magistrato alle Acque, who noticed the fact that the sediments brought by the surrounding rivers, which are not equivalent to those of today, which are controlled by dams, would have brought about the burial of the Venice lagoon. The decision he took then, was to turn the estuary of rivers away from the lagoon. We can observe the first river deviations on the sixteenth- century map. In the following eighteenth-century hydrographical map, which shows the land between the Bacchiglione and the Piave, we can observe the many deviations which were carried out. In this historical nineteenth-century map of the lagoon, we can already see the present order with all the decisions taken. Clearly, it was not an easy decision, but the power of the elders of the Magistrato alle Acque was an absolute power: no one could challenge the decisions they had taken, since challenging the decisions taken for the protection of the lagoon of Venice was tantamount to undermining the stability of the Republic and the sacred foundations of the fatherland.
Historically, the decision arose from a whole range of evaluations. The very decision of deviating rivers, as you can see, was not taken suddenly, without preliminary studies and experiments. Over the years, we have had an increasing number of deviations: the most difficult ones, for instance those of the Brenta/Bacchiglione, illustrated by positions 4 and 6, were carried out last century with the burying of the area one can observe from the Romea road towards Chioggia.
The cutting of the Portoviro was another important decision, which prevented the lagoon of Chioggia from getting buried by the sediments brought by the river Po. As you can see, we have marked the natural or artificial expansion of its delta in dark and light yellow. The hatched stroke represents the expansion of the delta without the cutting of the Portoviro. It was this no doubt invasive decision, thought out and realized with boldness and determination, which saved the lagoon of Venice.
Another historical member of the Magistrato alle Acque, Zendrini, dealt with the evolution of the coastline, which had always been protected through stabilizing intervention, since it is the primary defence of the Venetian lagoon. The coastline was further reinforced in the XVIII century, through a considerable work of engineering and, if so we may call it, of environmental commitment: the embankments. Here we have a picture of the Ca' Roman embankments, which assured the protection of the lagoon behind. Clearly, the embankments themselves caused a certain amount of damage: in front there used to be a beach, which gradually disappeared through the breaking of the waves on the embankments. Man adapts to everything: historically, there used to be a beach in front of the embankment, and now, in order to defend the lagoon, we re-created that beach, at Pellestrina, where it more adaptable and capable of dissipating the energy of the tide. Many spontaneous committees were born to defend the embankments, claiming that the beach which historically used to be there would have disturbed the typical Venetian embankment environment. What we are witnessing, then, is a form of adaptation among the inhabitants, which are used to know the lagoon as it is and will hardly accept any changes, even if they are only implemented to bring the lagoon back to its natural state.
It is worth mentioning a few observations which were made, and we decided to start a re-examination for the Lido project: the beach will be re-established, but under the water, in such a way as to defend the surrounding lagoon, while leaving the embankments as they are, without any apparent protection, in such a way as to maintain the appearance many Venetians are so fond of.
These are all historical problems the Magistrato alle Acque had to deal with. Later, significant anthropic changes took place, some of which you can observe on this map. Venice had to take a range of decisions to adapt to the needs of its inhabitants, and this caused several new problems. Which were the main problems? Reclaimed lands, the construction of a bridge across the lagoon, of the Romea road, of industrial areas, of outer wharfs in the 1800s, which have no doubt many positive aspects to them, but which also brought about negative changes. All these changes man brought about, subsidence and eustatism, caused the sea to rise of 24 cm last century, and a

series of new problems. While our engineers had fought to prevent the lagoon from being buried, they now had to fight to avoid it being swallowed by the sea.
If we look at today's lagoon, we can claim that all these anthropic causes have enlarged, deepened, flattened the lagoon and made it saltier and certainly more polluted. All this brought about significant damages, as this video shows'.
A FILM IS SHOWN.

'I believe – Dr. Piva continued – that we all remember what happened on the 4th of November 1966. Following these events, which took place in many parts of Italy, but affected Venice in particular, our various governments took several decisions: they issued special laws for the protection of Venice and its lagoon, now a matter of national interest, by which all the local institutions are to act for its protection. Law 171/73 clearly states that 'the State, the regional administration and local institutions must all concur in taking the necessary steps for its protection'. Another special law followed this first one, which also strengthened the staff of the Magistrato alle Acque, in such a way as to meet the new pressing needs and responsabilities. Law 798/84, which specifically allocated authorities, was particularly important. It assigned the protection and hydro-morphological re-balancing of the lagoon to the State, and the depollution of the waters to the regional administration, in such a way as to allow the State, regional administration and municipalities to jointly provide for the economic and social development, and the municipalities of Venice and Chioggia for urban maintenance. Here you can see all the special laws of Venice.
I would also like to mention law 139/92, which approved the General Intervention Plan. The General Intervention Plan was drafted by the Magistrato alle Acque to provide for all the various interventions for the protection of the lagoon. These are the aspects we can observe: high tide, which proved particularly invasive in the years 2000 and 2002, and the frequency of which we have notice in the past few years, and even this very year, in a period in which it should not be so frequent; erosion of the coastline, which caused a further erosion of Pellestrina, with its embankments, which had already been attacked by the 1966 flood; damages to many inlets, with significant breaches; erosion of the sandbanks, with an absolutely devastating degradation of the lagoon's morphology; degradation of the smaller islands, as in the case of the shore of the Certosa island; environmental degradation, with the spread of pollutants released by dumps in the lagoon and especially at Porto Marghera. We can then also observe the washing away of reddish substances released b the earth of the island of Trezze before its settlement.
The works carried out should oppose all these phenomena. they should solve all the problems we have just discussed, and defend us from exceptionally high tide through the MOSE system, from medium-high waters by raising the banks, from storms by re-enforcing the shores, from environmental degradation by means of morphological restorations and the safe removal of pollutants. All this must be checked and regulated in such a way as to allow the monitoring of everything which is carried out, as well as its impact on the lagoon.
Clearly, the Magistrato alle Acque is no longer the sovereign institution it used to be under the Venetian Republic: it lacks complete autonomy. An Inter-ministerial Committee for Guidance and Control, the so-called 'Big Committee', which acknowledges observations and proposals, approves them and takes decisions for further passages. A Technical Committee of the Magistracy also exists, which is roughly the equivalent of a High Council. We check all interventions through the General Inspectorate for the Lagoon, and carry out authorised work. Law 798 of 1984, previously discussed, required all works of protection to be carried out by one concessionaire alone: the Consorzio Venezia Nuova. I would now like to spend a few words for an update: you all know that this single concession was once debated, through an infringement procedure of the European Union. The legitimacy of the concession was confirmed, with the one requirement that all works for Insula protection, i.e. through the raising of the banks, which were still carried out by the concessionaire, should now be undertaken by the Magistrato alle Acque, and that the supplying of floodgates and electro-mechanic equipment should be let out on contract. The Consorzio will be responsible for their use.
When we are establishing a project, we base our work both on experiments and on already acquired date. Here you can see a picture of our new experimental centre at Voltabarozzo. It is the largest centre of its kind in Italy, an actual place where the Magistrato alle Acque can test physical models, for instance for the lagoon of Venice, as you can see in the following pictures which show tests taken in the floodgate tank. Here we can see the floodgates, on a scale of 1:10, in the following of 1:60. We also have models in various other parts of Italy. Right now we are preparing a model for the harbour of Trapani. Our name is known not in Italy alone, but internationally: we are building physical models for both Italian and foreign projects. We base ourselves on the General Intervention Plan approved with law 139/92, organising the data we have gathered with our information service. I dare say that the Venice lagoon, thanks to all the projects which are being implemented or planned, is one of the most studied environments in the world.
The outcome of our studies is kept in libraries, data-banks and support systems, thanks to which we can infer knowledge for future projects, as well as thematic maps which are also used by various institutes working on the lagoon of Venice. Here we can see an example of these thematic maps: bathymetry of the lagoon, use of the land, distribution of macro-algae in the lagoon, surface temperature of the water. The map concerning the use of the land, which was composed though the use of satellite images, will be used by the regional administration to identify illegal dumps. The Magistrato alle Acque, as well as other institutions, make use of all these activities for the protection of Venice.
Given my training in engineering, I would now like to discuss specific works we have carried out; but since this paper is about public administration, I think I should rather provide an update about what we, as public administrators, have achieved over the years for the protection of the lagoon through the Magistrato alle Acque. I will let engineer Mazzacurati, who will be talking this afternoon as

historical cities[16] and the role of organizations[17] - with an interesting round table governed by Giovanni Massagli and Giuseppe Zupo. The round table focused on the ROLE OF THE MEDIA:

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the director of the Consorzio Venezia Nuova, show you some actual examples of our work.

Here we have a few tables which summarize the figures for updated goals, as of the 30th of June 2003. We can see significant funding: figures for the convention, figures produced, remaining percentages, both for the protection from the high tide and for the reinforcement of the coastlines – the MOSE system – and of urban centres. We have the protection from storms through the restructuring of the outer wharf and the reinforcement of the coastline. Environmental protection through a morphological recovery and a halting of the degradation. Other collateral activities, destined to increase security within the lagoon: the removal of oil tanker traffic, the opening of fishing valleys, navigation aids. We have established the famous path, the luminous path one can notice from the bridge across the lagoon, to allow ships to pass safely through the inlet of Malamocco. Further research on the information system. Today we can claim that the State has paid us 3.147 million Euros, although we have reported 2.574 in the convention, and produced 1.636, with a 64% remaining.

If we were now to discuss the figures obtained by the 31st of December 2002, we could see how we raised banks and pavements for 70 km, raising 70 km of shores and banks, protecting in such away 1100 hectares of land. We rebuilt 38 km of beach, not only with traditional engineering techniques, but through the reconstruction of coastal dunes with natural engineering methods, for 8 km. We reinforced 10 km of outer wharfs, and gauged canals for a total of 120 km, to protect the environment. We reconstructed 700 hectares of sandbanks, protected 30 areas and environmentally recovered 11 among the most interesting islands of the lagoon. We are now working at San Francesco del Deserto, San Lazzaro degli Armeni, the most historical islands of Venice, and the ones with the greatest artistic value. We have been working on 4 different sites for environmental protection and the safe removal of pollutants. We fixed banks and canals for 8 and ? km. We removed polluting sediments for a total of 280 thousand square meters. We established two areas of phyto-depuration, and gathered 220000 square meters of micro-algae in the course of various campaigns during the summer months. Clearly, this is only a general program of our work, which reached its completion with the MOSE system, which is composed of mobile floodgates to close the inlets and of the works required by the Presidency of the Ministers' Council in March 2001. Here is an update: on the 6th of December 2001 the Big Committee, the Committee for Guidance and Control, arranged for the final planning of mobile works, having accepted the preliminary planning. The final plan was presented and approved at the of 2002. The CIPE included a first share of funding , for 450 millions, among the funding for great works required by the Objective Law ['Legge Obiettivo']. Last March, the Committee for Guidance and Control entrusted the Magistracy of the Waters with the executive planning and implementation of the works, including both mobile works and complementary works. We are now proceeding to build the outer dam of Malamocco. We will start working on the outer dam of Chioggia as soon as possible, and are planning the first works which will be realized through the executive project.

This afternoon you will be shown images which will explain how the MOSE system works. Let me point out we are developing research projects on the arrangement of the executive program. Here we have another image of the floodgate, on a scale of 1:30, which have been developed at Voltabarozzo. We have a mathematical model for the inlet. This is a schematic example of the works at Malamocco: you can see the row of floodgates, the outer wharf, which already exists on the northern side. The navigation basin will be realized at an appropriate size for the harbour's traffic. The southern wharf and the rocks, the complementary work required by the Presidency of the Council of Ministers in order to reduce the number of times the opening and closing of the mobile works will take place during the year.

What I did, then, was to present our activities, both the historical activities and the contemporary ones, including those we will be carrying out in the coming years. I would like close my paper with a sentence by Joseph Brosky we have found in a UNESCO publication: 'a work of art faces two alternatives alone: to illuminate the hearts of men or be destroyed. As these things usually goes, destruction is certainly a more natural choice, which requires no skill at all. Survival, instead, any kind of survival, and particularly that of a work of art, is a matter of experience'. I can assure you we intend to place all our experience, as a historical institute, to the disposal of Venice and its lagoon, to allow images such as these to be kept not only for us, but for future generations as well'.

[16] ***Speakers: Raffaele Raimondi*** *[The Conservation of Civic Centres Protected by the UNESCO]* ***and Antonio Tamburrino*** *[Methods of Intervention through the Integration of the Human Dimension in Environmental Problems. Conservation and Innovation in Art-Historical Cities: Rome, Venice: Decisional Procedures and Solutions]*

- ***Raffaele Raimondi*** *emphasized the importance of the Convention:*

'Firstly, allow me to thank all the organizers, and the President, Lawyer Vassallo and the Acting President, my colleague Abrami, in particular. I would like to thank you for having invited me to hold this brief talk in a most pertinent place, since the whole of Venice is a civic centre protected by the UNESCO, along with other cities in the Veneto, such as Verona and Vicenza. I have the pleasure of speaking after Prof. Taburrino's paper: my own paper is a sort of application of his. I must confess that the last words used by Prof. Tamburino worried me, since he was talking about innovation and development, which is something that concerns cities more than civic centres protected by the UNESCO. It is necessary here to explain what one means by civic centre. The term does not refer to a

specific monument in the area, but to inseparable whole, composed not only of those monuments, but of the entire location the monuments are set in. You can no doubt understand what problems arise for civic centres where monuments protected by the UNESCO are present, since in the case of other monuments, such as Santa Maria delle Grazie, with Leonardo's Last Supper, the intervention was no doubt a complex one, but simple enough for the State to carry it out, as I believe it did. Instead, when we are dealing with civic centres, we are dealing with an urban context, and the issue of conservation becomes an extremely complex problem. The 1972 convention, the Paris Convention, better known as the UNESCO Convention, requires the conservation of these whole areas, which are now protected by the UNESCO, along with their single monuments.

Dr. Gomez mentioned the problem of increasing our knowledge of conventions: a problem of information. Well, the UNESCO Convention faces this very problem. We know that the Convention introduced the need to protect civic centres, and preserve them for future generations. It is not a slight duty. Unfortunately, all this gives way to misunderstandings. The most common misunderstanding is this: often, once a site has been granted the UNESCO status of civic centre, one is lead to think: 'wonderful! we've obtained a UNESCO acknowledgment we can display in tourist guides', as if it were a guaranteed origin mark to boast of to promote tourism. This is not the case. Another common misunderstanding in the political milieu, which also explains the lack of implementation of conventions in general, and of this convention in particular, consists in thinking, once the UNESCO acknowledgment was obtained, that UNESCO will take care of the re-qualification and conservation of the area to be preserved for future generations, at its own expense. Well, you all know that the UNESCO is a United Nations body which is not particularly wealthy, and regulated by subsidiary principles, which we have only recently encountered in our own legislation (international law is governed by subsidiary principles). UNESCO, then, intervenes only in the case of sites and monuments in particularly poor countries. In all other cases, it is the State governing the protected area which has the duty of preserving the site for future generations. Article 4 of the UNESCO Convention commits the State to secure the identification, conservation, presentation and transmission of the whole protected area to future generation. To what extent? To the extent of using all of its resources. The Paris Convention requires the State to fulfil these duties by adopting legal, administrative and financial measures for the protection, conservation and restoration of its heritage.

You can imagine the difficulties the Italian State will have to face next year, when the government will have to account for the conservation of the protected sites which the UNESCO has acknowledged in Italy. Such conservation is also a pressing matter, since these ancient areas are gradually deteriorating. In some cases, one might not notice it; in other cases, it can be observed through sinking, damages, cracks, or even collapses in the more delicate civic centres of our country. I am now thinking about the civic centres of Rome and, even more so, of Naples, where last August a building collapsed in a protected area.

Let me clarify what these conservation works consist of. They are defined in a well-known law, a law particularly known to architects: law 457, which defines 'conservation works' as works of ordinary or extraordinary maintenance, of restoration, conservationist recovery, consolidation and restructuring, in areas where urban planning allows them. Of course, we are talking about urban restructuring. It is the State which has to carry them out. Since we are dealing with such articulate areas, in an urban context, it is not easy for the State to fulfil its duties. Perhaps, it is even appropriate for the State not to carry out these works, but it should, nevertheless, provide incentives for the public and private people concerned to personally perform works of restoration, conservation and recovery of these protected areas, not least because these civic centres are not merely an urban dimension, but, as in the case of mountains, which Hon. Ebner discussed this morning, it is also a matter of conserving the social fabric of the area. Civic centres are also made up of industrious inhabitants, social classes which should be maintained within these areas, which would lose their authenticity without them. Imagine what it would be like to have only banks, insurance companies, bureaucratic offices instead of artisan shops and stores of a well-established commercial tradition: this would completely alter the civic centre.

As I mentioned, it would be best for the persons directly concerned to re-qualify civic centres, rather than making the State or other institutions do the work, even through the rather usual system of contributions, which is still less desirable, since contributions require a number of requests, which should be instituted, and bureaucracy stands in the way of this process. It so happen that those who were relying on contributions might find out that there are no more contributions left.

The development and regeneration of civic centres implies a further aspect: the re-qualification of the workers involved. Many workers have little experience, but qualification is important: restoration, for instance, is not only a qualified activity, but an extremely qualifying activity. Workers with little experience might gain qualifications through their work of restoration, more so than through the professional training courses organized by the regional administration. Restoration work also requires an extremely prepared workmanship: geometricians, engineers and architects, which are all involved. Restoration work is not only a qualified and qualifying activity, but an activity which offers much employment. This aspect does not interest Venice, or the Veneto much, since youth unemployment is fortunately still very low here, but unemployment is an issue for the civic centre of Florence, or at least from Florence downwards. Here unemployment, and youth unemployment in particular, including the unemployment of architects and geometers, is also an intellectual unemployment with two figures. I am here thinking of Rome, and more so of Naples. Italy is the leading E.U. country for youth unemployment, ranging from the age of 15 to that of 25, but in the case of the Naples area, youth unemployment reaches the level of 65.1%, well above all other E.U. countries. The fact that architects are fired from certain universities in civic centres – Florence, Rome, Naples – with such an amazing heritage to be safeguarded and preserved for future generations, and have to find work abroad, is paradoxical.

But how are we to intervene to protect civic centres? You know that the governments from 1997 onwards issued and maintained an important, well-known, but rather indiscriminate law, which promotes the restructuring of the existing urban heritage. The urban

heritage must be preserved, as we discussed: the restoration work involved offers much employment. But the paradox is caused by little knowledge of the Convention and from a lack of information: with this law the State has failed to assure a greater incentive for conservation works in civic centres protected by the UNESCO as areas of great interest for humanity. If a 36% expense deduction for the IRPEF is provided for, but with an IVA of 10% for general restoration work on the existing urban heritage, it would be worth increasing the figure of 36% to 41%, and the IVA to 4%, in the case of civic centres protected by the UNESCO.

It is said – and this objection is usually raised in the bureaucratic milieu and in the parliament – that each time the parliament passes a bill which presumes some kind of expense, a problem of financial compatibility emerges, and the last article is checked to see if it includes the coverage required by Art. 81 of the Constitution. This is another false problem crafted by a short-sighted bureaucracy: as you can tell, we are dealing here with such complex, delicate, specific and widespread interventions that they would never take place without the appropriate incentives. The State will always profit, even from a 4% IVA. The State would also profit from the vast number of works taking place, were there any incentives. Not to mention the kind of emergence our Minister of the Economy, Hon. Tremonti, and the Confindustria President D'Amato seem so keen on: the emergence of small industries providing work illegally. If you allow for an IRPEF deduction of 41% on expenses and for a 4% IVA, a dialectic process between the consigner on the one hand, and the contracting firm on the other, would take place, whereby the consigner would regularly ask for his invoice, and the companies which provide illegal work would be exposed.

Perhaps I should end my paper with a warning from a man extremely aware of these values: our president Ciampi, who is not only a man with economic interests, so to speak, but a man of letters as well (he has degree in literature, and manages to unite economic and cultural aspects, which go together better than one might think). President Ciampi often spends the weekend at Naples, in the Rosbery villa, a beautiful State-owned villa at Posillipo, and talks walks in the civic centre of Naples. On one of these occasions, in front of the local and national press (the Corriere della Sera), President Ciampi said what might be said of all civic centres protected by the UNESCO, for all the wonderful areas acknowledged to possess an extraordinary value for humanity: focus on art and culture, this is your treasure. Thank you'.

*- **Antonio Tamburrino** [Methods of Intervention through the Integration of the Human Dimension in Environmental Problems. Conservation and Innovation in Art-Historical Cities: Rome, Venice: Decisional Procedures and Solutions] stated:*

'This issue is strongly felt and a central one, particularly in Italy. We have historic cities which are among the most important in the world: Venice and Rome, just to mention two. How should these cities deal with the present and future? Should we aim at conserving what we have, or also introduce significant innovations? Clearly, at an intuitive level it is hard to find anyone opposing conservation, but the problem is that of defining conservation without limiting innovation. The most tangible example is provided by modern transport systems. The most advanced metropolitan cities show their most dynamic aspect in modern transport systems. Often, when we find ourselves in Paris, London, Hong Kong or Pecking, we can notice how everyday life, with its relations, exchanges and meetings, takes place in a far easier way compared to our own civic centres, given the more updated and functional transport systems. So what are we do in the future? Are we to merely accept this penalization? The issue is particularly felt in Venice, since transport takes place by water, and when problems emerge, for instance in the case of strikes, transport is often difficult. What criteria should we use? Are there any criteria to guide us in our choices, which can often drastically change the identity of a city? We are in Venice, so we all know that a project for subway transport is being discussed. This is a complex issue, since it puts the very nature of the city, which is based on waterway communications, at stake. Some fear that all this might upset the very identity of the city. What criteria can we use? The criteria we have is that of sustainable development, we have often discussed today. This criteria is constantly referred to, and might end up acting like a key to open every gate, used for everything; and precisely because of its universal nature, it no longer can be used as a criteria. the term was recognized so universally, that I still haven't come across anyone claiming to oppose sustainable development. This then cannot be the solution, since it is too broad a term. But how did we get to discussing sustainable development? We reached this point through two phases, since a great expansion of our civilization took place after the last World War, through industrial development. Industrial development lead to a rapid deterioration of our habitat, to the pollution of land, water and air, so that by the 1960s a movement was born focused on conservationism, to preserve what was under attack. The first World Conference on the Environment, which took place at Stockholm in 1972, was centred on this very idea of conservationism, of complete conservationism, even at development's expense. The Stockholm Conference discussed only one central idea: conservation. But although one may agree with the conservationist idea, our own life is clearly a dynamic life, in constant change, and conservationism cannot fulfil our essence, since it does not contain the idea of becoming. We all agree with the Stockholm Conference, then, but we are actually still thinking in terms of development, which does not cease. By the time we reach Rio, the terms had changed: the central issue was no longer conservationism, but development, which was only accompanied by the term 'environment'. The term used at Rio was: environmentally sustainable development. The following change had taken place: the issue of conservation had been replaced by that of the conservation of development, with the environment becoming a term and condition for conservation, which is no longer a complete conservation. Dr. Gomez himself claimed that biodiversity does not merely mean conservation, but use as well. This is a delicate passage. Sustainable development is a kind of synthesis between the two needs: the need to preserve and the need to change, to better and become. The two needs have not yet been met, and we still haven't found a way to reconcile conservation and transformation.

Where can we look for this element of synthesis which will provide a sure guide today? Our idea of conservation rests on a scientific concept which we consider of great importance: the concept of entropy, which derives from physics, the second principle of thermody-

namics; a rather obscure principle, one may claim, an oppressive one, which states that whatever man does will only increase disorder. This principle was then further generalized by asserting that everything tends to universal chaos, with or without man. This is the principle of entropy. So if we were to apply it, as we often do, by connecting it to a biblical concept, our action can give way to order, but only with certain space and time limits, for it is destined to disappear in the long term. Our action, with this Damocles sword, is rather limited, and loses its fundamental meaning. Sure, we can act, build beautiful cities which we must preserve, along with nature, etc., but all this will simply last for a certain amount time and then disappear. What is happening? This basic concept, at the basis of all other kinds of development, in physics, economy, sociology, etc., has been further replaced, albeit unconsciously, by the most recent developments in physics, which is the hardest science, the one which all other sciences are based on. While in the 1800s thermodynamics, i.e. entropy and chaos, were at the basis of our development and civilization (steam engines, trains, etc.), we are now abandoning, or at least replacing that world with other more advanced scientific fields: informatics and quantum physics, for instance. What are we finding out, then? That beyond this apparently macroscopic thermodynamic order, there is greater order. In other words, we are discovering a world made up of information more than 'perhaps' and particles. This is the world of changing information, which grows instead of deteriorating. The idea is a rather simple one: if we have something material we can pass it from hand to hand and it will deteriorate; at the most, if we have two coins, we can exchange them. If we have different ideas and exchange them, we all become richer, with more ideas. This is the basic concept emerging not only at a sociological land information level, but also at a physical level. From a wider point of view, this also includes thermodynamics: in quantum physics absolute void does not exist anymore, it is only a world were events and energies unfold.

So, to sum up, where we used to have the cultural limit of entropy and chaos, conceived by basic science, we now have a broader idea of creative, un-ending order. We can now think of a development which is not spatially or temporally limited, which continuously gives birth to order. We can pass from the idea of sustainable development, which is something temporary and rather improvised, to a far more interesting and stimulating idea: creative development.

In the case of creative development, we need to maintain and preserve everything that exists, or else nothing will be created and all will change and be lost. There is room for conservation, then, in creative development; not only that, but conservation stands at its basis, although conservation is not all there is, but merely a premise for a further development, which introduces new ideas and solution, i.e. a creative development.

How can these principles be implemented? Our cities are no doubt important, historical cities, which all the world admires, and which developed on the basis of their creativity. Our cities are not commonplace cities, or else no one would visit them. Our cities – we are all aware of this, but it is worth emphasising anyway – have written the history of world urban development: our cities are milestones. I would like to mention a simple idea: human civilisation was born with the creation of cities. It was conventionally born in Mesopotamia, but where in Mesopotamia? When cities developed, since cities fostered writing, social relations, class divisions, etc. Everything was born there. The development of cities has been the one human invention with the greatest impact on nature and the planet. Man really started shaping the planet with the invention of cities. Early cities, however, precisely because they were new, were closed cities, enclosed by walls. It is often said that a city is its own walls: why? Because the creative element was still rather fragile, and had to be safeguarded and protected from external attacks: it wasn't lively enough to feed itself. The decisive step was taken with the passage from the enclosed city to the open city. Historically, the city of Rome has been the prototype of the open city. Rome created a civilisation from a 'civitas', a city. Rome had walls, the walls of Servius, which it used to consolidate the first area of town. When Rome reached its imperial dimensions, it had no walls, it was completely open, since it was possessed by a strength of radiation it channelled outside. This radiation strength was based on an innovative transport system. Consider the spread of the street network, and the fact that Rome developed the first water transportation system in the world, of which Venice became a heir, based on the Tevere river, and extended in all the world. This was a revolutionary innovation, truly an ex-novo creation. Roma had other walls, the Aurelian walls in the III century A.D., but its creative spirit had dwindled: the history of Rome starts and ends with its walls. After the fall of Rome, part of its heritage was gathered by the Marine Republics, and by Venice in particular. In its most splendid years, Venice had no walls and was a creative city.

My conclusion is that today we possess a rather productive idea, which strengthened our awareness of the issue of sustainable development, in such a way that we can move to a vaster, more stimulating and thrilling phase: creative development. This creative development contains the history of mankind, which cities, and Italian cities in particular, played a central role in because of their creativity.

We are now at a crossroads: should our cities be merely conserved, or should they be vested with strong elements of innovation, new means of transport, of urban, social and economic planning? We possess this heritage, which reflects, to some extent, human evolution, a heritage which should provide the incentive to turn our cities into examples, not only of conservation, but of innovative transformations in the social life of man, and offer the premises for a new standard of living in the third millennium. I believe, suggest and hope that the Academy may support this commitment to develop a new model for our standing of living, bearing in mind this extraordinary heritage and writing a new page in the fascinating history of our existence.'

[17] ***ALDO DI BENEDETTO*** *[The Role of Environmentalist Organizations]*

The speaker stated:

'Conservationist organizations have certainly played, and continue to play, an important role, which we might define in terms of their spurring public opinion, which is usually bewildered. In the course of the years, these organisations have studied the risks connected

INFORMATION AND THE SOCIAL AWARENESS, with the participation of the following journalists:
- KATHY SMITH [18] [for many years a BBC and ITM journalist in the United Kingdom; today, a freelance journalist based in Brussels focusing on the environment, and the author of the film realized for the European Environmental Commission] ,
SERGIO FRIGO[19] (Gazzettino) and ANTONIO LOPEZ[20] (Airone)

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to pollution, and pressured public opinion and politicians. Environmentalist organizations and conservationist groups also played an important role in the establishment of protected areas. For instance, our National Park of Abruzzo, Lazio and Molise is a rather old protected area, established in 1923, at a time when little was known about the environment. An organization from Bologna, the Pro Montibus et Silvis, which organized scientific trips around Italy, visited this area of the Apennines, a geographic crack between two mountain chains which extend side by side for several kilometres at 2000 meters of height. These people studied the unique characteristics found in this territory and took part in the founding of the first Italian National Park, the first nature reserve in Italy.
Subsequently, after the war, around 1948, other people gave birth to the Italian Movement for the Protection of Nature, following the wreckage caused by the war. This perhaps little well-known group possessed a conscious environmentalist outlook, in relation to all those elements which can cause disturbance and problems such as pollution.
I would like to end my paper here, since I do not want to take up any more time. Let me point out that environmentalist groups today can play an important role by aggregating people, awaken public opinion and, thanks to the help of technicians, experts and scientist, lead a process of social emancipation. No doubt, such groups are often too radical, since they oppose development and political decisions which might clash with environmental interests. These stands must also be accepted, because without them there would be no discussion, and discussion is essential in the democratic development of our society. Thank you.'

[18] *'Only half an hour ago I found out – the journalist said – that I was scheduled to talk. Had I known it earlier, I would have prepared my speech weeks ago. As a TV journalist, I am used to speaking in front of millions of people through cameras, but addressing a real audience scares me.*
I've been working for the BBC for many years, as well as for the ITM in the United Kingdom. I am now a freelance journalist and live in Brussels, where I focus on environmental issues. I am also working on a video on the environment for the European Commission. Themes may change, but things like 'The sustainable development of cities' in Vienna and 'Renewable energy' in Switzwerland can be found on all European TV stations. I hope it doesn't sound like I am making an excessive promotion for the Commission – this is not what I intended to do.
I also deal with so-called 'media training': professional training in the field of the media. I visit organizations and companies to help them deal with the issue of mass-medias. A group I have been working with, and which you certainly know, is the WWF, a big environmentalist group, which is well aware of the importance of dealing with mass-medias to make one's activities known at large. As you no doubt are aware of, there are prominent researchers in this hall, who know the issue well, but people outside these walls, the common man on the street, also has to be aware of these issues, and he can be informed by journalists. The WWF is aware of how important communications are.
The most important thing is not to spread too many messages which might confuse public opinion. One must understand which are the most important messages to focus one's information campaign on. Some people suggested that the Academy should act as a kind of guard to check the ratification of various treatises. This is something journalists might be interested in, since they tend to have a rather simplistic vision of the world. We like stories with heroes, goodies and baddies: the story of an old lady pushed to the ground, for instance, where it is easy to understand who is good and who is bad. In the case of pollution, pollution is the baddy. Or take the story of losers: all the Venetians who witness the gradual destruction of their city might be losers. The winner, the baddy, might be the man exploiting a given situation for his own profit, etc. We like to see stories in a rather simple manner.
The first thing a journalist does when he is given various pieces of information is to ask himself: what then? This is a kind of test for us. We ask ourselves whether this piece of information is important, if it conveys a message. With this simple test we can understand whether the piece of information is important or not. From what I have heard so far in this hall, it would seem like we are dealing with several interesting issues.
Nonetheless, each journalist needs a kind of guide, someone who can tell him what is important and what is not, since the journalist is not a specialist. You are specialists, and this is why the journalist needs someone to tell him what is important. We, as journalists, are experts in various things, and at the same time we are no experts at all. We think we know all for one day, then we move on to a completely new issue. It is important for you to provide journalists with some kind of guidance. Journalists have their own agenda. You have your own, so it is important to unite these two approaches and points of view. You have to let the journalist know what you want people to know, and the journalist himself must measure his own personal interest in all of this. You must also bear the journalist's approach in mind.

I don't know if there are any question about journalism and environmental issue, for instance. The whole issue of Venice, is an issue every journalist would like to deal with. Every journalist would like to describe Venice, and certainly this is not where your Academy ends: there are many other issues a journalist could inform the public about. I would now like to ask you if there are any questions'.

[19] *'Allow me two preliminary remarks: – Frigo stated – I am only talking for myself, and not for my newspaper. I am not an expert on environmental issues: I merely deal with culture, but all is culture and all is the environment. Secondly, I am working for a newspaper which is the newspaper of the north-east, and would not like to talk about Venice so much, which has been discussed a lot this morning, but about the surrounding area, i.e. its hinterland. I don't how many of you are Venetians, so perhaps many of the things I will say you will already know. Those of you from outside might learn something new.*

The issue is this: it has been a couple of years since we have ascertained the degradation of the so-called north-eastern model, the Venetian model. This model is based on a fragmentary development, a widespread industrialisation, a complete occupation of the land through industries, settlements and infrastructures. What has changed in the past few years is that we can notice an impasse of this model, and a sort of resistance in the public opinion, and even in the productive world, to this kind of development. Basically, we have understood that the resources at the basis of this kind of development are running out. I am thinking here about the agricultural, ludic and industrial use of the land. Another resource which is running out is manpower: we have less and less workers, and are forced to turn to immigration, with all the enrichment and problems it brings.

If you wonder around the piedmont you will find 'no more industries' posters in the streets. This is a form of resistance, a sign of psychological, cultural, structural and economic distress which reveals how people have become aware of the fact we have reached certain limits. These limits have been set by increasing pollution, unbearable traffic, and a loss identity. All this has lead to a replacement of a once enjoyable life-style with a noxious one, and to a kind of awareness which can be found not only among common people, but in the productive world as well. The latter's response was that of de-localising the industries, i.e. of transferring them abroad for economic reasons, and of turning to productions of greater value and with a lower environmental impact.

I personally held some debates on these issues last summer in the province of Vicenza, on the Asiago plateau – earlier, we were talking about mountains. In the course of these debates we handed out a questioner which provoked some interesting answers. I will refer to three. First, though, I would like emphasise the fact that this is not a scientific survey: it was merely carried out among those present, who were mostly well-educated and not particularly young. 87% of those who took part in the survey had a degree – so they were to some extent part of the governing class; 43% were of an age between 54 and 65, while 34% were over 65. Let me show you the results. The first question posed was: what should development in the North-East lead to? For 26% of those who answered it should lead to a better society; for 23% it should lead to the protection of the environment and local traditions. We then have a greater spread of culture, order and safety and a greater political relevance for the area. One of the next questions was: what should we abandon to favour the development of the North-East? Most people answered: individualism. Most people stated we have too much individualism, and this is one of the problems facing our society. 13% answered 'part of our consumption', 12% 'a further expansion of infrastructures and industries'. In order to live better, we need to reduce our level of consumption and the spread of industries. I would like to emphasize the fact that 14% also answered in the opposite way, unyieldingly claiming that we ought to be less rigorous in our protection of the environment. The last colour slide I would like to show you concerns the following question: what aspect of the future frightens you most? A significant percentage answered: the political situation. Over 30%, however, answered 'environmental degradation'.

I would like to stop here, although I also have other surveys. What all this shows is that we are witnessing a new environmental awareness, which is the topic of our debate. Clearly, this mostly concerns well-educated classes, since it is they who are the first to be aware, perhaps in a different way, of such issues, which newspapers also tend to deal with. Clearly, I should also mention the rest of the population, which is made up of workers and investors with needs of their own. But let us interpret these events, and not merely describe them; let us interpret them, if possible. I would like to read you a beautiful sentence I have come across in Guido Piovene's book 'Viaggio in Italia', which was written 50 years ago. Piovene writes: 'at Treviso, and in the surrounding area, there are many industries. The landscape has been spoiled by vulgar buildings and new customs. It is not a real change one can observe, as much as the frustration of an ancient life-style. A cleft can often be perceived in Italy between traditions, the landscape and the modern life-style, which appears somewhat empty. The inhabitants are like occasional visitors with no history of their own. The cause of all this, I believe, is the urban spoilage committed through speculation and a lack of affection'. Very few journalists, I believe, could describe with such incisiveness and emotion what is going on around them today. We have some excellent colleagues: Gianantonio Stella, Rumiz, Iori, Lago. All these colleagues are carrying out this kind of narrative and interpretative work very well, but on the whole one must also observe that our profession has declined in the past few years. We work less on the land, and more in our offices, on the phone, through internet, rather than meeting people and asking them precisely what is going on in their everyday lives. Less money is spent on travel and research. We pay more attention to layout, graphics and small news articles of newspapers than in the past, when we used to focus more on the content and originality of articles. Publicity is increasingly invasive and affects our choices, since we sometimes decide whether to publish a certain item of new or not on the basis of whether its subject is an advertiser for our newspaper or not. It so happens that advertisers, in Italy as well as in the rest of the world, and perhaps more so in America, might be offended by something the newspaper publishes about him, and withdraws his investments. This happens quite frequently. No doubt, we, as journalists, are guilty to some extent, since we are rather lazy, superficial: we know everything, to quote my colleague, but at the same time no nothing at all. We are also rather lazy from an intellectual point of view, and guilty for all these reasons. Behind us, however, we find a structural issue.

On a closing note, I would like to outline a different approach to these issues. Until people, readers – for readers are also responsible to some extent, perhaps as responsible as journalists – will grow bored of finding gossip articles, fake scandals, crime news and society news, and start promoting a different kind of journalism, the situation will not change. What we need, is an active reader who can teach journalists how to carry out his job. This is a practical issue: it is a challenge, for journalists, to describe important and demanding events, such as environmental and social issues, in a vivacious and lively way, as to capture the interest of those readers who would usually be indifferent to the matter. I believe some improvements have already been made.

I would like to end my paper with the example of smoking, of the smoking habit. You all know that smoking has been censured in the past decades by the press, by television, cinema, etc.; socially, it has become an anomalous behaviour. I believe we, as journalists, should also turn contributing to pollution and waste into a social stigma. In the case of excessive heating, polluting cars, etc., for instance, we should lead people to believe that this is not merely something which negatively affects our society and future, but that it is also something aesthetically unappealing. What is happening now with smoking, for those who smoke are usually considered to be unfashionable and passé, should be extended to pollution and those who pollute.'

[20] *'I am the editor and correspondent for the monthly magazine Airone, – Lopez declared – a rather specific magazine, dealing with environmental issues. It is over 20 years old; initially, it focused on national parks: 15 years ago, a mere 3% of this country was protected. 15 years later – in this very hall we have Gianluigi Ceruti, who is directly responsible for the law on protected areas – we can claim that Italy is the European which has developed more from the point of view of environmental protection. All this not only thanks to a vast movement focused on environmental issue: we too, through the magazine Airone, can be credited with a little merit for the progress made.*

I am opening my speech on a positive note, not least because what I will be saying, to answer a few of the questions posed, will be rather negative. I would like clarify a point, since what we are dealing with is probably also a matter of ethics, the very ethics those in the field do not always accept entirely: we are living in a country were, as I found out from recent surveys, according to Amnesty International, freedom of the press is gradually diminishing. Some say we are the 40th country in the world from this point of view. One of the reasons for this is the concentration of television and press organs in few hands. I'll be as straightforward as possible here: our Prime Minister also owns several TV stations.

Here is another problem: I am working for a periodical; if periodicals did not contain publicity, they would all close down, since, if no one buys, rather than merely reads, our magazines, these will close. The problem we face, and I am here talking both as a journalist and as a representative for the editorial committee of my publishing group Giorgio Mondadori, is that of not allowing publicity, which is a recent development in field, which developed in the last 20 years. That is to say: often, particularly in specialised periodicals, we encounter articles which are not always written freely and clearly, but as means to sell certain products. We who work in the field often read these articles and get upset; we get in contact with those responsible to solicit them to guarantee citizens' right to read honest articles and be correctly informed. These are central issues which concern the future of our job. It is journalists which ought to insist on the matter.

Paradoxically, through a small and specialized magazine like Airone, which has approximately one million of readers interested in environmental matters, each month I meet with one of our readers, who has written a letter to us, in order to discuss a specific issue. Before coming here, I was in Maremma, where cauline, a substance used for the production of ceramics, is poisoning one of the cleanest rivers in Italy, the Farma river. 15 days ago, following the report of another reader, I found myself by the delta of the Po river, in an important park in the Emilia-Romagna area. Well, earlier on we were talking about eco-compatible development: here someone came up with an eco-compatible tourist village within the national park by the delta of the river Po. I wouldn't like to dwell on this too long, just let me point out that this profession, journalism, ought to communicate elaborate, complex issues in a simple way, as to inform as many people as possible about what is going on. A few months ago I met an American scientist, an expert on environmental changes at the University of Camerino, who told me that the academic world has to change its attitude, since it's half-asleep. The problem is: who is aware of the issues, who is carrying out the research, how know the facts? It is appropriate for these people to inform both journalists and common people. One should not hide behind his role: I should carry out my duty, but it is often hard for me to receive the news immediately, in such a way as to make them known to all. For we are living in country where people either personally looks for pieces of information or, generally speaking, comes across insincere pieces of information.

This television idiocy, which TV information has fed us for years: all TV news ends with society gossip. One might say that frivolity, not the virtuous ability to tell stories in a lively way, for all to understand, including the young and less cultured audiences, but the tendency to turn everything into a show, dominates the news with its emotion. Our duty, then, is that of educating people. We have very clever colleagues, those whom my colleague from the Gazzettino mentioned before, who are a living example of this. It is equally true, though that researchers and academics have to deal with the issue as well. We need to educate people, and particularly school students, to understand a kind of subliminal language: many things happen, which are more violent and more serious than one might imagine. This, to answer the question previously posed by the engineer, is the challenge I believe we'll have to face in the future.'

24 OCTOBER 2003
ENVIRONMENT, CULTURE, INFORMATION AND TECHNOLOGY

Afternoon

Part 4

INFORMATION TECHNOLOGIES AND ENVIRONMENTAL PROBLEMS. METHODS OF CONTROL AND THE STUDY OF ECOSYSTEMS. THE ROLE OF PUBLIC AND PRIVATE COMPANIES.

Papers in the afternoon [part 4 of the programme] focused on the METHODS OF CONTROL AND THE STUDY OF ECOSYSTEMS AND THE ROLE OF PUBLIC AND PRIVATE COMPANIES. Among these scientific and exhaustive papers, were the one on biological markers of damage[21], and

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[21] ***Speaker: Prof. Pierfrancesco Ghetti, chancellor of the Ca' Foscari University of Venice and founding fellow of the IAES*** *[Environmental information. Biological markers of damage].*

'The title of my paper refers to environmental information – Prof. Ghetti stressed in his introduction – and this in itself is an important point. Another important aspect is the name given to this conference: International Protection of Ecosystems. Since we are talking about ecosystems, rare creatures, we should first understand what we mean by term and why we are talking about ecosystems. In Italian we have always hared of land, landscape and environment. The term 'ecosystem' is not so well-known. I lecture on ecology, so I won't get stuck on the term.

Why did I make this premise? I believe the novelty of this conference lies in the very idea of ecosystem, in the fact that the term is beginning to emerge in culture in general, whether juridical, economic or scientific culture. What do we mean by 'ecosystem'? We mean an environment, seen in terms of its functioning: each environment has its own way of functioning, not like a machine, but through a series of processes, chemical biological, geological processes, which interact one with another and emerge through the quality of the water, air, soil, and food – if by 'food' we mean the products of plant or animal organisms. Ecology, then, unlike what one may be lead to think, was not developed to protect monk seals. Ecology was developed for the protection of the human species, and if the need for a scientific reflection about a different kind of paradigm than the one found in traditional disciplines emerged, it emerged when we realized that traditional disciplines (engineering, rather than chemistry, jurisprudence, economy and agriculture) had all emerged when man had to learn how to exploit natural resources for his own good. At a given moment, faced with the consequences of this cultural development, with population growth, and particularly the increase of a part of human population, this kind of exploitation clashed with the environment's ability to regenerate substances essential for life and production: water, air, the soil and food. What should we wonder about? We should be amazed at the fact that the air outside our house is un-breathable: this terrible; we have gotten used to so many things, but this is too much. The same goes for the pollution of the sea: we are not talking of a little steam by our house, but of the final outcome of extremely complex environmental processes.

Steps forward were also taken in the juridical field, starting, I would say, with the legislation for environmental impact assessment in the 1970s in the United States. It may seem strange, but it was in the U.S. that the idea to include the protection of ecosystems in the legislation was first developed. This was later transferred to the provision of the law for environmental assessment in Italy and Europe, and to recent provisions, such as those about water management, the state that the goal of each recovery plan is not to restore the health of waters alone, but of water environments. This makes a huge different, since in the first case, water was seen as a mere product to be put right, while the protection of water environments entails the protection of a complex system by which the water itself is automatically restored. It is a completely different perspective we are dealing with. It is clear, then, that such consideration, that these developments in the environmentalist thought emerged when the environment was undergoing a crisis. It was not necessary to deal with the issue 50 year ago, or 100 years ago, since there was enough water not to affect human health. But today the problem is that of administering the human environment: we have to possess enough knowledge to secure, both today and for the future, the environment's ability to constantly provide 6 or 7 billion people with water, air, soil and food. This is the scope of the problem. In local terms, I ought to point out that I agree with those who claim that the Venetian lagoon is not a natural environment. This is certainly true. Venice is the greatest challenge – if so I may call it – man ever sent nature. And this took place a thousand years ago, when the greatness of Venice lay in its ability, through empirical knowledge, to find ways to make this environment work, and balance the needs of

those on the control of ecosystems through a satellite system[22] and/or telecommunication systems in the case of environmental emergencies.[23]

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nature with those of man. The lagoon was used for fishing and to defend the city: it had a number of functions and different roles. Venice could not exist without its lagoon, and the lagoon could not exist without Venice, since it represents one of the most dynamic environmental fields of development known: the lagoon, by its very definition, is constantly changing. Had we left the lagoon as it was, we would have something completely different today. Why had they to deviate rivers? They might have been wrong, but they did it because the sediments rivers brought were burying the lagoon. They had understood that the Venice-lagoon system had to act as a functioning whole: our whole territory works by means of the tides, which make the system work. Let me explain. Consider the waste produced by houses with no sewers, which ends up in drain well constantly cleared by the tide. Why must canals be cleaned? Because they are like the arteries of the city, and water must be allowed to flow through them. No doubt. he whole lagoon revolves around this exchange of water. It takes Lake Garda 28 year to exchange all of its water, and a mere second in the case of river, where water is constantly flowing; the lagoon is somewhere in between the two: it might take it a day, a day and a half, two days, three days, depending on what part of the lagoon we are taking into consideration. What we need, is to understand how this organism works.

A few words about the MOSE project. We need to know how this system words. As you mentioned, we deviated rivers, but the lagoon functioned for years. We built embankments, and still the lagoon remained. Canals were made for oil tankers, deep canals in a lagoon environment which has an average depth of one meter, with a strong current. All this works- although it could certainly work better. Let me add: we can do several things in the lagoon, fishing included. We tend to forget, for instance, that the powerful boats pass through the lagoon, ploughing its depths. This is something you'll notice from a plane. We have sediments, found in a completely stable water environment, which we constantly plough. We have all the pollutants from Marghera, which gathered and scattered everywhere. The finest parts of these sediments float with the tide, and attacks chemical pollutants. The biggest amount of pollutants is to be found in the smallest particles, where there is a greater surface development.

These are my considerations: why can do what we want if it has a superior aim; we have to know what we are heading towards. We have to understand whether this intervention offers one advantage alone, the protection of the city, which is nothing slight, or whether we will also manage to handle it. One should also consider maintenance works, bulkhead's vaults, how this interferes with the circulation of water and with other uses, such as the use of the lagoon as a harbour. The distortion of the flow of the waters through navigable canals, the role of which we should know. Fishing and tourist management also makes sense. Our ability consists in governing this human environment in such a way as for it to constantly reproduce itself and last forever. Thank you.'

[22] ***Speaker: Dr. Paolo Cecamore from Telespazio*** *[The control and study of ecosystems. The role of satellite control]*

'I would like to thank the President fom the chance he gave me to briefly discuss this issue. – Dr. Cecamore said in his introduction – I am Paolo Cecamore, the person in charge of the environmental monitoring area in the earth observation section of Telespazio. I would like to discuss the MOSE in particular, and mention a series of experiences we underwent in the past years. I would like to use these experiences to show you what the possible contribution the tools we commonly employ at Telespazio could offer to environmental control and the realization of systems of support of decisions which can allow us to manage the environmental heritage of our country in a better way. Not of our country alone, however, for the characteristics of satellites allow a global vision, thanks to the so-called synoptic property.

We are all used to observing satellite images in the evening, during weather broadcasts. Well, these are the most characteristic marker of our ability to watch the whole earth at the same time. This very synoptic characteristic, along with the fact that several observations are possible at close intervals of time and that images can be used to obtain significant information, gives us an idea of how this instrument can be used for the monitoring and analysis of the planet's ecosystems.

I would like to mention three or four examples to show you what we can actually do. I have been personally involved, since the early '90s, in quasi real-time environmental monitoring, that is to say: in the use of satellites to observe phenomena taking place on the land and provide those responsible for making decisions with the necessary information. A specific case I was involved with is that of the incident of the oil-tanker Haven, which occurred a few years ago, in 1991. I must say this was a rather pioneering enterprise at the time, but it no doubt proved how we can use images to provide information on a catastrophic environmental event taking place. In those days the various authorities responsible for taking decisions involved us through the furnishing of images and image elaborations concerning the incident. Here you can see two data entries of the event through two kinds of optic satellites. Satellites of the same kind are still used today. Here you can see a picture taken on the 14^{th} of April, and one on the 15^{th}; the area I am now showing is where the spillage of oil occurred. You can see how it is possible, through an analysis of the area at different times, to observe the course of a certain phenomenon, analyse the changes and provide means of prediction for it future developments. This is a day after, with two different satellites.

I dare say this was one of the first emergency cases in which we were able to provide information for the final result immediately, within two or three hours, with a lapse of time fully compatible with the operative requirements of the Civil Protection, and to provide useful information. In particular, in those days one could witness a great interest in the areas nearer to the shore, where the spillage of oil

was evident. In the first 24 hours, however, the area I am showing through our satellite pictures had not been taken into consideration: but planes had not passed it, since they were focusing on the coast instead.
Here is another example: you can see how the smoke in those days affected a vast area of the sea. I would like to show again how satellite images can face our need for information in the case of events like these. It is most important not only to know where the oil spillage is, but where it is moving towards, i.e. to predict the future. From this point of view, images alone are not sufficient, but can provide us with the initial position of an oil spillage which is spreading, as well with images which are hard to obtain, such as the field of surface currents in the sea at the time of the incident. Through an analysis of approaching sequences such as those of weather broadcasts, it is possible to provide information on how the so-called thermal fronts are moving in the water. These in themselves are a first marker of what the actual field of currents is during the event. Stable fields of currents, the so-called climate fields, do not always take place the very day, at that very moment: those are 'average' events. When an incident takes place, it is essential to know what the field of currents is in that very moment.
This is a standard example: in those days we activated a model for the circulation of sea water, with traditional parameters, which provided certain results. It couldn't, however, represent the situation we had witnessed, i.e. the portion of oil spillage which was moving outwards, whereas it could represent the other portion very well, through the depiction of a field of currents we had reconstructed through a sequence of images, which was the actual field of events. Proof of this came when we employed a model for the dispersion of pollutants and managed to reliably reproduce the actual form of the oil spillage which was forming. What I was going to say, then, is that in certain specific situations, such as these, where we are faced with need to have precise and punctual pieces of information, it is necessary to use tools such as those we are working on. This is the field we managed to depict.
A few words on the spillage of oil: as I mentioned, that was a rather pioneering enterprise. Gradually, the situation evolved in the course of the years. In the case of the vast incident which took place last year, the wreckage of the oil-tanker Prestige off the coast of Galicia, we had many more satellites, specifically designed for the observation of superficial oil pollution, such as radar satellites, one of which was recently launched by the European space agency. Here you can see an example of the observations made through this satellite. In those days Telespazio was involved through a consortium known as Telair, also in the observation from plains, since Telair owns several planes furnished with sensor, and radar sensors in particular. We took part in this international support project thanks to the Spanish authorities, who sent the plane in the area and took pictures such as those you can see here, in such a way as to observe the evolution of the oil spillage with a higher resolution and a time lag in satellite data entries.
Observations of this kind are regularly carried out in a series of projects we have organized with the European space agency and the Italian space agency. These are a couple of examples of observations we routinely carry out, in this case to identify the areas which are more affected by this problem.
Besides our involvement with the lagoon of Venice when the mucilage phenomenon occurred, we were involved in a monitoring campaign in the 1990s, when the phenomenon was at its peak. I would like to mention another issue I believe to be extremely important for it proves the means satellites provide us with in dealing with the environment: the issue of those phenomena associated with our analysis of certain events, such as illegal waste dumps, which we can observe through our satellite image archives. Let me focus on a specific example we have been working on. In this case as well we have a series of repeated observations, something which is normal in the case of today's satellites, with the possibility of carrying out various analysis at different moments, i.e. to reconstruct certain events from their first appearance in the past. This is a specific case we have been working on: an analysis of the events surrounding an illegal waste dump in the coastal areas above Naples, near lake Patria. You can see how we were able to use sequences which were not too close one to another, since we were concerns with the development of events in a 3 or 4 year period. The historical archives at our disposal allowed us to objectively reconstruct the events which took place in the area.
I will give you a schematic example: in support of the activities later carried out by the Environmental Unit of the Carabinieri [military police], we followed the evolution of a certain area we possessed various kinds of data about – this means you will see both colour and black and white pictures. We know the area had been subject to various charges through a period of time. Here you can notice the area where pits had been dug. These had gradually been filled by the stratum' ascent, and later completely filled by waste dumps, which were then filled in. The situation in 1999, which is when we carried out this analysis, was that of an area covered by natural soil. In the course of time, by analysing the sequences of images, we managed to spot the actual process that had taken place. In a first phase, the pits had been partially covered in water; in later phases the lakes had been filled: in this area you can notice a vast area which was turned into a dump. We have photos which show the situation at the time, and when it was then filled, in such a way as to appear like natural vegetation. All this reveals the importance of the use of historical archives for the monitoring of phenomena of this kind.
Since I have little time left, I would briefly like to discuss a few other interesting applications concerning environmental issues. One of these applications concerns the issue of fires, which we were particularly concerned with this summer, when we were searching for areas where fires had broken out. These very days, a discussion is underway on the possibility of changing the restrictions on the suitability of these areas for building. All this shows that the use of high-resolution data allows us to carry out observations at a cadastral level, i.e. to get to know the situation, and whether there are any areas which are subject to fires at a cadastral level. I would also like to mention a few interesting experiences about our ability to observe movements of the earth, such as subsidence and landslide movements. Such observations are carried out through the specific elaboration of data acquired by radar satellites. This technique was discovered in Italy, and we have the privilege of be working on it. This is no doubt an important feature of hydro-geological monitoring, which satellite data can provide important applications for. In this case, I wanted to show you an analysis we carried out on phenom-

ena of subsidence in the Naples area. This red area here has been subject to a 10 cm. deepening in a 7 year period, which was primarily caused by excavation works carried out in the metropolitan area from 1992 to 1994. An objective analysis of the images allowed us to notice the phenomenon. This concerns the aspects of the anthropic impact, whereas, if we were to refer to natural phenomena, which are more in line with the themes discussed in this conference, we can show how, with the same methods, we can analyse the gradual shifting of a landslide. This is an area of Mareatea. Thanks to this analysis, known as differential inter-phenometry, we were able to reveal not only the landslide which occurred in the civic area of Maratea, which our observation focused on, but also further less well-known landslide movements which were later analysed in detail through scientific observations.

Here are some conclusions: we can certainly claim historical records, which span about 25 years, allow us to reconstruct past events. This is most useful in the case of all the analysis of environmental impact. No doubt, synopticity, i.e. the global information we can obtain, our possibility of observing any area on the planet, is an important advantage which can be employed to study other areas as well. The information we can obtain from the pictures is of an objective kind, and can be used as a basis to be integrated by other means of information, since satellites are certainly not the only necessary instrument to observe the land and the environment: we also believe that all technologies should contribute to this goal.

Since it seems to me that we are presenting the various aspects of the problem in various ways in this conference, I would like to emphasize the idea of the convincing power of images, which satellites can furnish. This allows to claim that we are able to provide objective information through these instruments, information which it is also extremely useful to divulge. As you can see, the possibility of proving what one wants to prove through the use of images no doubt strengthens one's arguments.

On a closing note, I would like to mention the fact that it is seems to me we are now witnessing a strong technological evolution, and the necessary premises for technological assessments from the point of view of the availability of satellite data which can be used for environmental monitoring. In particular, I would like to mention the program launched by the Italian Space Agency, known as Cosmos Skimmed, which is an attempt to realize a string of satellites for the monitoring of the land for civil protection and environmental control. On the other hand, I would also like the underline the growing interest of authorities. Allow me to mention the program known as G.M.E.S., Global Monitoring for Environment Security, which was launched by the European Union and the European Space Agency, which Italy plays an important role in. This aims to establish means of observation of Europe and the planet to control the land and the environment. On this note, I will end my paper. Thank you.'

[23] ***Speaker: Dr. Giancarlo Ruscitti from Enterprise Digital Architects*** *[Enterprise Digital Architects' Telecommunication systems in the case of environmental emergency].*

'Having the fortune of been the last speaker, – said Dr. Ruscitti – I would like to reassure you: during the last discussions, I removed quite a few slide, so I won't be speaking for long. Moreover, I am not actually an architect. I am a doctor, a doctor who stopped practicing years ago: let's say I am a structure doctor; my job is a rather peculiar one, which is also why I tried to keep my paper is short as possible, in such a way as to show you how technology should help us to live in a digital economy.

Enterprise is a name which might mean little or nothing to you. Actually, you should find a more well-known name behind Enterprise: Ericsson. Ericsson, this very spring, chose to increase the role it has historically held, especially in Italy, as a technology provider, and at the same time as a provider of services and projects. In the past few years it also chose to become a complete outsourcer for clients working in industries or public administration, which are unable to deal with complex issues through the use of new technologies. We ought to bear in mind that technological developments have been so strong in the last 10 years, that those who work in public administration offices or in industries are no longer able of dealing with what the market has to offer. In our country as well, an idea is developing according to which one pays for a given service and controls it without supplying it. So Ericsson decided to embark on this adventure and change its name to Enterprise, in such a way as to increase the separation between the mere technology provider, which occupies about one third of the telephone market in Italy under the name of Eriksson, and a company which also focuses on other activities.

Today, I will try to answer Prof. Abrami's question, which he posed in the title of the theme, and to show you how these things are taking place in our country, in its various regions, in some cases with difficulty, and how investments are under way. Particularly the field of public administration has been ready to react, in these years of economic recession, to face a series of needs. What we are dealing with, then, is not only the MOSE issue in Venice, but a whole series of territorial problems in the country. What we are trying to do is represented in the second term: architects. Why do we call ourselves Digital Architects? Because we not only plan, but attempt to apply our solutions; we are able to do this, since we own about 50% of the whole technological infrastructures on the Italian market. Many operators – Telecom, Albacom, and the rest – are currently employing our infrastructures. The market peaks, that is to say, the big purchasers in the field of public administration or the industry, use Ericsson technology. What this means, is that when we present ourselves as service providers, we have an advantage, since we know very well the kind of technology employed.

As a first example, I would like to discuss our last achievement. The Mountain Community of Vallo di Lauro and Baianese is probably unknown to those who live in Venice. But if one reads the municipalities involved, Sarno e Bracigliano, he will immediately recall the deaths which took place there. Everything my colleague from Telespazio said is true: we are facing a situation of hydro-geological disruption accompanied by the carelessness of the public administration in terms of building management and industrial production. The answer was the establishment of mountain communities which approached the issue of territorial control not merely from a conservationist perspective, but in order to monitor the risks and to allow new buildings, for this is an area of Italy where people are still having children, and the population is on the rise. New buildings and industries couldn't simply be forbidden. This was easier, since

the disaster had unfortunately already occurred, and the population could hardly tolerate a rigid bureaucracy. Today it is experiencing this very bureaucracy as a means not only of survival, but of development.
What happened? These communities identified the problem, and obtained funding from the national government to administer their territory in an advanced way, but they realised they lacked, even when federated one with another, the technological and human resources to allow an effective control. What they did then, was to call for European tenders: our society then came to administer the whole territory. This means that today the various communities can control the effects of rain, of geological movements which might occur dependently or independently from climatic reactions, and forecast buildings and everyday innovations, as well as inform the Civil Protection of anything that might cause physical damage to the population in time, thus saving many lives; all this thanks to the networks, territorial data, GSM technology and hydro-pluviometric tools we have established in the area.
What concepts are we focusing on? Firstly, awareness: we have a system of data gathering which employs both satellites and other means, which mapped all the municipalities in the area. We then have instruments which allow us, as I previously mentioned, to preserve the territory, and to simulate actions which can be verified. The MOSE is a local example of simulation of what one might expect in the case of human intervention. Actually, in the case of more widespread areas in which public administration itself has less control than the Magistracy of the Waters, the simulation of various conditions is extremely important, since a transaction takes place between the supplier, let's say in the public administration of services, and those living in the areas, who expect some outcome.
***An important factor: administration.** We are personally administering this service under the control of public administration. Through a public administration mandate we are conceive of the **conservation and protection of the environment as a means of development.** A message we can convey is that we are not merely seeing this as a means for the technological development of a company which answer a tender, but as a means of development for those living within a protected area.*
It is often possible to identify areas of urban interest in our country; considering them protected areas means turning them into economically more advantageous areas for further funding and development.
*I would also like to show you where we are carrying out similar activities. Here in the Venet,o we are working for the **Agro-meteorology** Department, administering the meteorological monitoring network. In the province of Taranto, we are working on the protection of intensive productions. Here are a few examples: we are also working on the Adriatica highway, which goes from Taranto to Ancona; we are administering meteorological stations, since you know well that in a country such as ours the control of what goes on on a highway, a railway track or in an airport is crucial not only to deal with territorial emergencies, but also with environmental emergencies. If damage occurs, it is necessary to know how to evacuate those areas and deal with dangerous substances. Something similar happened a few months ago on the highway near Trieste: the highway was blocked by a disaster; we had to handle everything which took place before and after that event, in such away as to avoid the incident turning into something even more serious.*
Here are some other activities we are carrying out: early in January we will be opening the head office of the Civil Protection of the Region of Lombardy, in collaboration with Telecom Italy for the management of the rivers and waters of the Lombard mountains, in order to avoid calamities. The aim of the Region is that of establishing a portal to inform both mountain communities, small municipalities and citizens, who can get to know the condition of rivers where they live and obtain information on any damage and what the civil protection considers a calamity, through the use of internet.
*Sicily provides other quick examples. It would seem like it never rains in Sicily, but you have seen that last week whole areas were flooded. Those who have lived in places where a phenomenon of that sort happens so rarely that when it does occur it is completely unexpected, knows how hard it is to defend oneself, and that in this region, where we are also **managing catchment basins, we were able in the last few years, thanks to technology, to identify areas and apparently hidden water resources, and to allow the regional administration and the municipalities to better know the availability of water and to deal with summer problems more accurately***
*I would like to end my paper with another example. I have mentioned two examples from the South, since, given what the other two speakers discussed, I thought it might be important to underline the fact that we are not merely taking care of the North, but of the South as well, which is often seen as a backward area of Italy. Investments are certainly made, and perhaps this idea of public and private co-administration is more advantageous there, where little is to be found, because it is easier to reach some results. We recently **obtained the authorization to manage – and I am obviously talking about electronic, not physical management – the disposal of waste in Campania and Naples, which, as you can imagine, is not a simple task.** What is going on, then? We have established a network which allows us to identify the anomalous areas of waste collection. You all know that it is anomalous areas which can cause problems. We also manage the transport of waste on lorries to the collection areas of Campania. **This means we can manage situations of waste obstruction in given areas. You might recall last year's problems, which arose from our impossibility of making a complete use of certain deposits, and the need to manage the waste produced by the city of Naples on a daily basis. This is also the case with common problems, such as traffic, the lack of lorries, difficulty in waste disposal, which are managed in a more intelligent way today, thus allowing the waste disposal department of the regional administration of Campania to know what is going on exactly.***
*Clearly, these systems are directly related one to another. Again, **in the region of Campania we are also managing the urban transport system, that is to say: we are allowing the regional administration to monitor not only waste disposal, but the circulation of goods within an extremely complex network of roads as well.***
What I wanted to show you through these brief examples, at the end of a rather long day, is that the use of friendly technology, for we

To provide an idea of the vast scientific contribution which emerged in these papers, it is worth quoting a passage from the speech given by the Telespazio representative:

'here are some conclusions: we can certainly claim historical records, which span about 25 years, allow us to reconstruct past events. This is most useful in the case of all the analysis of environmental impact. No doubt, synopticity, i.e. the global information we can obtain, our possibility of observing any area on the planet, is an important advantage which can be employed to study other areas as well. The information we can obtain from the pictures is of an objective kind, and can be used as a basis to be integrated by other means of information, since satellites are certainly not the only necessary instrument to observe the land and the environment: we also believe that all technologies should contribute to this goal.'

Another paper of great importance was the one given by Prof. Giancarlo Ruscitti, who pointed out that Enterprise Digital Architects can provide high-level technology services for the prevention of disasters and the management of environmental problems (waste, hydro-geological disruption, drought, etc.).

Another stimulating paper, both for its discussion of historical issues and for its great relevance to the present, focused on the issue of the so-called MOSE project[24] and on the connected vexata quaes-

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are talking about the same technology you are employing in the case of a GSM or an advanced mobile phone, is entering our everyday lives, and that societies like ours can contribute to current debates by claiming that a kind of technology exists which should not be seen as an enemy, but as something which can help us to improve our living in an intelligent way; most importantly, it can help us understand complex phenomena which are often perceived in municipalities or small regions, and require intelligent networks to allow us to manage open spaces.

In the Veneto, in particular, we can deal with a metropolitan area like Padua, integrated transport networks, issues connected to the harbour and corridor 5, relations with eastern Europe, only with a technological system which can facilitate the movement of people towards integrated regions; otherwise, nothing will be done: the people who, like me, make use of highways, know that an Italian lorry undergoes several controls, whereas a Slovak or Slovenian lorry does not, and this often causes problems on our highways. Thank you.'

[24] ***Speaker: Engineer GIOVANNI MAZZACURATI, Director of the Venezia Nuova Consortium*** *[The public and private protection of the lagoon ecosystem]*

The speaker discussed the MOSE project with the aid of Power Point:

'I am Giovanni Mazzacurati, director of the Venezia Nuova Consortium. My Consortium is a State concessionary. My paper will complement the one the President of the Magistrato alle Acque gave this morning, when he discussed all the problems from a historical point of view, postponing what I was going to say, including current projects. I first need to provide a framework, though. I will try and provide a synthesis and then discuss the MOSE project, as Dr. Fortuna suggested.

The aim of the Consortium today is the physical protection of the Venetian lagoon. Here is a photo of the lagoon today, which was maintained by man's intervention, as Dr. Fortuna mentioned. In the past centuries, man prevented the lagoon from being buried by the sediments brought by rivers, and the advancement of the coast, which would have removed the huge advantages the strange choice of building a city at the centre of a lagoon offered: transports, military issues, hygiene, the exchange which always took place in Venice and Prof. Ghetti discussed. Venice was the only ancient city with a sewerage system. Unfortunately, today it is the only modern city without a sewerage system, because it is not working as it used to. The lagoon of Venice maintained this condition because Venetians deviated the Brenta, Piave, Sile and Po, which did not end in the lagoon, but threatened of burying it from outside. Between 1600 and 1604, Venetians carried out this amazing work.

The crucial issue first emerged in 1966, when an extraordinary event took place, which, however, is not as extraordinary as one may think, since, as Dr. Fortuna mentioned, it might repeat itself at any moment, in an even more devastating way. At the time, the embankments provided the only bulwark to stop the sea, while the lagoon was wrecked by the high tide.

The event gave way to much ferment, with the development of researches, juridical activities, and the issuing of laws, to of which are particularly important: law 171 from 1973 and another law from 1984, aimed at protecting the lagoon. It establishes a guiding 'big committee' in Venice, made up of 10 personages, public authorities, 6 ministers and 4 local mayors, which provides guidelines for the protection of the lagoon.

tio on the steps to be taken to deal with flood tides Venice. Dr. Mazzacurati also answered a question which was posed to him at the end of his paper, by mentioning the fact that a possible collapse of all the mobile dams 'while they stand tall' would not pose any danger to their arrangement:

The colour slide you can see describes the role of the Venezia Nuova Consortium: the committee give the Ministry of Infrastructures the necessary guidelines, and the Ministry makes us of its Magistrato alle Acque, which president Dr. Piva discussed this morning. The Magistrato alle Acque makes use of its concessionary, the Venezia Nuova Consortium, which is a private group composed of construction companies, and has an almost ancient origin, if so I may say, since it is was founded in 1975, when the Superior Council for Public Works examined various projects; in 1982 the Council issued a resolution which stands at the basis of our following research. At the time, the Italian government acted in the same way as the Dutch and English when they had to face similar problems, and provided a group of specialized companies with the work to be done under certain conditions. The issue – as the President of the Magistrato alle Acque mentioned today – was examined by Europe, which confirmed the legitimacy of what had been done. This is now the aim of the Venezia Nuova Consortium within the scope of the State's policy, and has autonomously been organized by the companies it represents. The Consortium consists of a group of companies, which I shall later list, but has maintains a defined individuality of its own and complete autonomy.

The companies are amongst the biggest Italian companies: Implegilo, the Società Condotte d'acqua, Staldin in the Italvenezia Cosortium, and other consortium which are composed of the most important Venetian companies. The Venezia Nuova Conosortium has been established a long time ago, for the issue has long been debated. We oughtn't wonder about the duration of these events: the issues of the Schelda in Holland and Thames in London were debated for 40 to 50 years. All great hydraulic interventions entail an inevitable decisional labour. Even the great decisions taken by the Venetian Republic, such as the deviation of the Po river, took 80 years; the work itself only took 4 years, but the decision took very long.

This colour slide shows a picture of our intervention: on the left you can see the engineering projects, so to speak, even if the term is not very popular now. On the right, you can see environmental interventions. Above you can see the central intervention: control of the tide through the MOSE system, through local defences, the strengthening of the coast, which is chiefly about the embankments, and the restructuring of the guardian wharf, the wharf delimiting the inlets. Here you can see the environmental interventions: morphological recovery, the stopping and reversal of the process of degradation.

Let's start from an examination of the environmental interventions. Here you can see a slide illustrating the nature of the Venetian lagoon. Lagoons are a very different thing from bays, and posses an extremely complex morphological structure, which ought to e maintained in order to created and determine biodiversity, i.e. biological complexity and turnover. If the lagoon is flat, and we place a cork on it, it will rise and fall with the tide, roughly remaining in the same position. If instead we have a complex morphology, after a few tide cycles, the cork will exit the lagoon. The turnover quality, the liveliness quality and speed are all connected to morphological issues, and to the conservation of such morphology.

For the first time in the world, 15 years ago we devised a system to maintain the nature of the lagoon for as long as possible. While earlier on canals were dug, and the material removed was dumped in the sea, 15 years ago we devised a simple system to keep the sediments from the excavation of canals within the lagoon; with time, the sediments solidify, grasses over, wood contamination disappears, and we find ourselves with a similar, albeit artificial, condition from the one of sandbanks, the stretches of earth in the lagoon, a condition which is both hydro-dynamic and biological.

Here is a description of the sandbanks and of their method of reloading. These are spray dredges.

As far as this kind of work is concerned, we established 700 hectares of sandbanks, a pretty vast surface (I believe Venice is around 600 hectares, just to give you an idea). The number of islands are also very important in the morphological reconstruction. We recovered many islands in the lagoon, around eighty, which have a historical and artistic values, and which were heavily degraded. Here, for example, is the Isola degli Armeni, which was subjected to an intense work of recovery. There are many other islands of this kind.

During the morphological reconstruction, important archaeological discoveries were made. You might have hared about the discovery of a fifteenth-century galley, of great artistic value. During this reconstruction work we have come across many findings in the lagoon, which were preserved.

The important halting of the degradation of the lagoon is closely connected to this morphological recovery. There are material deposits in the lagoon, which derive from the manufacturing processes which took place in the XX century. Since 1917 Marghera became active; this is a photo engineer Piva also showed this morning, the Grezze island, a deposit of bauxite, a material used for the extraction of aluminium, which was deposited there. Passing over the area on a plain, one could see all these red spots which were released. All these things have been prevented with systems which are also rather simple and inexpensive: they were blocked through the use of diaphragms, and completely isolated from the water. For instance, even the areas where industrial plants were built, the oil deposits were old deposits for polluting substances- here you can notice their release from the water. After the works were carried out, you can see this release of pollutants in the water completely stopped.

Another important aspect of environmental intervention is the need to exclude oil supply through the lagoon. About 12 million tons of oil are carried through the lagoon every year, 5 million of which are crude oil. The crude oil travels on oil tankers with a capacity of

'I would be glad to answer you. Firstly, it might be possible for one or two floodgates to collapse: in this case, everything has been organized in such a way as to have a rise of 5 cm alone. This would be the effect. Let's suppose we have a general collapse, that a huge hand were to suddenly remove everything. If this were to happen, well, we'd have a flood, since the MOSE system is not working yet. There would be no other consequence: this has been clearly shown by models. In the case of the

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80 thousand tons each. If one of these tankers were to explode, or if an accident were to occur, the damage would be irreparable: the spillage would spread across the lagoon and stop any biological activity. In the meanwhile, we developed this shining path which allows us to extend the working hours of the harbour and security at night and in foggy days. We are working on a pipeline which should lead from one oil terminal to the lagoon – this is how it looks –, whereby oil tankers can unload from outside. This is not a final solution, since an explosion there would still be harmful, albeit less so than in the previous case.

If we now were to turn to engineering interventions, I should emphasize the importance of embankments for the defence of the coastline, which separates the lagoon from the sea. This photo was taken in 1966 and shows how the coast of Pellestrina was basically broken through, and the embankments were about to give way. The reason why the embankments can give way is that after the deviation of the Portoviro, which took place in the XVII century, the supply of sand diminished. Here is a photo of Pellestrina, where you can see how all remains of the coast is a thin line. So the only defences the Venetian set up from the XVIII century were these embankments. We have carried out this work along 70 km of coastline, from the Adige to the Piave. You can see a series of normal panels, perpendicular to the shore, which are enclosed in the sea with a hidden dam, and then filled with sand gathered in the open sea. Much research has been done on this work. These cells have been tested. The sands' calibre was also tested, in such a way as to secure the resistance of the structure. This was done in three or four places in the world. This is also the biggest work, which has yielded excellent results. This is the Pellestrina coast, this is the finished work: you can see the panels, the transversal wharfs, and the dam filled with sand. This photo gives an idea of the whole structure, composed of two adjacent cells. On the right you can notice the sand filling; on the left, it still had to take place. It's as if we were dealing with two different meteorological conditions: on the left the sea breaks on the rocks, here it is mitigated by this long coastline. Besides this, all sandbanks were restored with a naturalistic intervention which worked very well. All guardian wharfs were restructured as well. Guardian wharfs are the two wharfs at the inlets, which allow us to check the level of the depths and prevent the inlets from being interred. These wharfs were in a pitiful conditions, and about to disappear – here you can see them before our intervention and after it. So what we did was rebuild them.

Let me now talk about the prevention of flood tides, which the MOSE system in connected to. First, let me describe the defensive strategy employed. This slide shows the sea, lagoon and inlet; these are civic centres. With local interventions, we have chosen to defend civic centres up to 1 and 10, that is to say: until the water rises 1 meter and 10 centimetres above level 0. When the water rises above this level, a special operative system is employed, the so-called MOSE, by the inlet; it starts functioning by isolating the lagoon from the sea, in such a way as to keep the water of the lagoon at a certain level. We have intervened in all these civic centres where the level of water was lower. A few remain uncovered, San Marco among them, which is the most important: as you have seen this morning, even with a relatively low flood tide, it gets flooded. The work on San Marco will be carried out over the next 4 or 5 years; it is the most delicate job, and complementary to the MOSE project, because in such a way we can close the MOSE for an unlimited number of times.

Here are a few examples: the work at San Marco; the island we are working on now; this is another area, the Zattere. We have carried out a huge amount of work of this kind, to the extent that Europe, as the President of the Magistracy mentioned today, said it was enough, for we had enough experience. I would say that this happened on our suggestion as well. These are the Zattere before our work, and these are the Zattere after it: we have fixed the water level in such a way as to avoid them being flooded up to a level of 1.10; we also arranged the sewerage system and drainage.

This is a particular work of ours: the civic centre of Malamocco. Its shore was raised. Malamocco was one of the lowest areas of the lagoon (0.70), and was flooded about 100 times a year. I think the decision had been taken to abandon it. The shore was raised to 1.20, 1.30, and its three watercourses were cut off with some floodgates, which begin to function – here we should have a video, if it works – when the water rises above a certain level. In such a way, it is now 10 years since the civic centre of Malamocco was last flooded. The situation changed completely, and the economy as well: all ground floors are now inhabited. Malamocco has provided a small example of what can be achieved with a structure of this kind.

The reason why we had to intervene after 1966, as the President of the Magistrato alle Acque mentioned this morning, is that the relation between land and water changed this century. According to our estimates, there is a 25-30 cm change. This significantly increased the frequency of flood tides. This graph shows the flood tides above a certain level which took place in the past decades. The phenomenon increased, particularly in the last 10 years. Schematically, this is the structure of the MOSE: metal coffer-dams anchored to the floor. The floor is made up of concrete coffer-dams. The coffer-dam starts to float when compressed air empties it of the water; by the principle of Archimedes, the coffer-dam rises, floats, isolates the lagoon from the sea and maintains the difference of level. We used to have better videos. Now you should see the group of floodgates rising in less than half an hour from the time the alarm is sounded. These are oscillating structures which don't resist water, but accompany it: basically, waves swing them, so we have no problem what-

Vajont dam, we had almost 300 m of height; here, we are merely talking of one meter. The difference between outside and inside would be of a meter or a meter and a half. After a kilometre, the metre turns to 30 cm, expanding. You can't notice this in Venice, we don't get this effect at all. It is utterly insignificant. To claim something like this, more than removing the dam, is an act of terrorism. To talk about Vajont in this context is ridiculous. Let us think of the relation, energy travels by quadratic equation. Anyway, a specific test was made on the Voltabarozzo model, and it can be repeated continuously.'

These, in brief, are the interventions and papers for the 24th of October:

Michel Ebner (Paper with power point)	The protection of mountains : E.U. policies
Antonino Abrami	Appraisal of Ebner's paper
Antonio Franchini (president of the session)	Considerations and introduction of Gomes
Gomes (Paper with power point)	A national plan for biodiversity
Antonino Abrami	Considerations about some solicited aspects of the paper
Antonio Franchini (president of the session)	Considerations and introduction of A. Tamburrino
Antonio Franchini	Considerations on Tamburrino's paper and introduction of Raffaele Raimondi

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soever. Allow me to point out that in my opinion, this is a particularly functional structure: we have 400 meter openings without any piers, aerial structures, or intermediate structures. At the end, we will consider the project in relation to the projects carried out in other countries. I believe this is truly invisible structure when its mouth is open, and that when it is closed it the difference of level between the lagoon and the sea it causes is minimal.

This shows the Malamocco inlet, with its navigation basin, its floodgates, and the MOSE (at point 1). This is a dam we are about to finish, and which was inaugurated this May. Some say: 'well, but you haven't built the MOSE yet'. But this is the MOSE; it is as if someone were to say, referring to the construction of a building starting from its foundations: 'you haven't constructed the building, only its foundations'. This is certainly true, but we one ought to start from the basis. In this case, we had to start from this dam, since it stops wave motions to break in. A part from its final goal, which should be of reducing high tides, average high tides, it also allows us to work quietly and to limit the oscillation of the MOSE floodgates.

Point 3 is the navigation basin, i.e. a canal provided with an inlet and outlet, which allows ships to enter with the tub, that is to say: to enter when the sea level closes this door, opens the other, reaches the level of the lagoon; it then allows us to keep the harbour open even when the barrage is closed. Here you can see how we used to have waters 12-13 m deep, with the dam emerging. This is a very recent photo.

A harsh debate took place, when the we were ordered, particularly by the municipality of Venice, to meet a number of conditions before starting our work. We accepted all these conditions, the most significant of which I can quickly describe here, and proved that they are not directly connected to the building of the MOSE.

We were asked to furnish this canal in such a way as for it to work, while allowing the possibility of raising the level of the inlet, because this might entail a reduction of middle to high flood tides. We will carry out the whole project, while at the same time independently evaluating the hydraulic effects of this raising, and considering whether we should reduce the level, which is currently estimated to be – 14, to –13, 13.50, –12.50. This choice might bear negative consequences on the turnover, but it should be made if the advantages are those one might think, and which it is not possible to precisely determine, if not by using a 1 to 1 scale.

As I previously mentioned, certain countries, the Netherlands and England in particular, had to face similar problems. In the case of the Thames, for instance, the English blocked the river with the barrier you can see, and build something extremely visible: cutwaters 60 meters one from another, with cylindrical floodgates which block the floodtide with their rotation. A choice of visibility was made. The Dutch made a similar choice in the case of the Schelda. The Schelda estuary was a most dangerous estuary: the Dutch are particularly aware of these problems, and were in serious danger. They then built piers at a distance of 80 meters one from another, with guillotine floodgates surmounted by a road. At Rotterdam, they build a barrage made up of two circular sections which close off the Rada when it rises above a certain level. This system, which someone had designed for Venice, cannot be applied to Venice, and was rejected by the High Council, chiefly because it is based on boats; these have a significant environmental impact, and only work with waves below one meter. At the inlets, waves can reach 3 meters, so the project could not be applied. I think I have finished. I would be glad to answer any questions'.

Antonio Tamburrino (Speaker)	Methods of intervention through the integration of the human dimension in environmental problems. Conservation and innovation in art-historical cities: Rome, Venice. Decisional procedures and solutions.
Antonino Abrami	Considerations on Tamburrino's paper.
Antonio Franchini	Considerations on Tamburrino paper.
Raffaele Raimondi	The conservation of civic centres protected by the UNESCO.
Antonio Franchini	Considerations on Raimondi's paper and questions for Ebner.
Michl Ebner	Answers to the questions.
Giovanni Massagli	Presides over the continuation of the discussion as a moderator and introduces Piva's paper
Maria Giovanna Piva (Speaking with audio and visual aids)	The role of the Magistrato alle Acque of Venice

PREVIEW OF A FILM.
DEBATE.

Architect Foscari [intervened in the debate] Dr. Conte [intervened in the debate]
Antonino Abrami: conclusions after the first two days of discussion.

2nd WORKSHOP : 'THE INTERDISCIPLINARY PROTECTION OF NATURE. THE PROTECTION OF THE MARINE ECOSYSTEM AND THE FLUVIAL ECOSYSTEM"

WORKSHOP MODERATOR: MARCELO ENRIQUE CONTI

Workshop participants:

Philippe Bourdeau:[25]	The recent paper by the European Environmental Agency: measuring the progress and environmental degradation of the marine ecosystem, and the value of environmentalist ethics
Giovanni Cecconi:	Sedimentary regime and coastal protection;
Giampietro Mayerle:	The sedimentary balance of the Venice lagoon;
Oscar Ravera:	Eutrophication: its causes and its solution;
Antonio Tamburino:	The Mediterranian Action Plan: its contributions and the ecosystemic vision of the Mediterranean. A problem still open to debate…..;
Giovanni Damiani	Problems connected to running waters and areas of transition: the lack of research and of the knowledge of data about polluting cargoes from pigsties and other settlements. The absence of monitoring.
Pierfrancesco Ghetti:	What models of intervention for the Lagoon? The CULTURAL value to be respected with the re-establishment of sandbanks, the consolidation, nourishment and reconstruction of dunes.

[25] *'I would like to mention a couple of things related to the topic of this conference, this workshop, and to the Academy's priorities.'* – said Bourdeau – *'Here is the first. Engineer Tamburino was talking about his bicycle: this caused some improvements. Let's take, for instance, this recent report from the European Environmental Agency, which considers progress and deterioration (yes, we also have cases of deterioration). Consider an example which might interest Prof. Conti: the release of metals in the sea at the hands of industries, which lessened significantly from 1985 to 1999. This is progress, the result of conventions, provisions, etc. But we also find cases of deterioration. What we can do, then, is consider the situation. The problem is a rather complex one: one ought to manage, as you mentioned, artificiality, i.e. the human ecosystem. This requires taking the whole into account on various levels, for we ought to consider the flux of human population, the flux of energy and materials, to analyse them and assess the situation. Pollution will make up a small part of these fluxes, our produce another, etc.*

It is possible to study such system – and this might be a matter of interest for the Academy – as Medous did, as a limit to growth in 1972. We then had improvements; now we also possess methods of measuring the flux of energy, which can provide some markers. At a regional and local level, it is possible to achieve so-called sustainable territorial development, which attempts to combine planning, economy and environmental management. This is a new technique, but we still face a problem of import and export in the case of regional schools.

By studying the various levels, it is possible to obtain a more precise picture of the situation and of its development. As we can see today, population increases with the use of resources: the population consumes more, although we know that 20% of the population uses 80% of the whole resources. This is changing: consider China, for instance. So, if we have worked everything out, we can see how we cannot continue to consume as much as we do today in Italy or America. Here is where ethics step in, I believe, for technology will never manage to compensate all those deficiencies: we cannot possibly think that technology will solve everything, so what we need to do is to change our behaviour, through coercion, through laws, etc. This might work for certain issues, but, better still, we should personally change our own behaviour by adopting a code of ethics, a rule of conduct which might be accepted by the whole of humanity, whether Buddhist, Christian, or of any other faith, and by finding a common way of dealing with the environment, which is something I think we can achieve. This is why I think the environmentalist ethic might become one of the aims of the Academy, an aim which I haven't yet found in its charter.

1st WORKSHOP : "THE INTERDISCIPLINARY PROTECTION OF NATURE" THE PROTECTION OF THE MOUNTAIN ECOSYSTEM;

WORK GROUP MODERATOR: MASSIMILIANO MARANGON

Themes which the participants have discussed following these points:

1) coherence in respecting the already defined areas to be safeguarded and promotion of the areas of integral protection of the forest ecosystmes of mountainous areas and safeguard of the profound unity of the mountain ecosystem.
2) definition of the productive activities compatible with the mountain environment, with the the exclusion of the "extreme" ones, which are aggressive given the loss of the aesthetic and cultural aspect of the mountainous ecosystem.
3) whether or not to favour any reconstruction of the little rural estate in the Alpine area.
4) infrastructural problems to be solved (viability, trains, parking lots), bearing in mind the particular fragility of the mountain ecosystem.
5) whether or not to favour Appennine parks by promoting the recovery of coppice and degraded woodland by reinforcing forest trees and bearing in mind all possible productive activities outside the protected areas.
6) with a European perspective in mind, safeguards to be extended to Eastern Europe too.
7) from the point of view of tourism, not to open areas destined to failure and environmental spoilage, without any stable economic return on the market, when perhaps these are partly or entirely marginal areas which are incapable of pooling. An incentive to favour other, pastoral or sylvan inclinations.

hose taking part in the workshop:

- Giacomelli : An experienced Public Prosecutor for piedmont areas in Vicenza
- Frando Pedrotti : proposal of a model for mountains, to be extended to all mountains of temperate Europa: the Alps, the northern Appennine, the Pyrenees, the Caucasus, etc.,
- Renato Andriolo: the importance of the farmstead ['maso chiuso'] and of local traditions for the protection of the mountain environment and of the economy of Alto Adige[26];
- Markus Feichter: the importance of the farmstead and of local traditions for the protection of the mountain environment and of the economy of Alto Adige;
- Gianluigi Ceruti: the farmstead as a factor of stability and of social continuity….

2nd WORKSHOP : "THE ENVIRONMENT AND HUMAN HEALTH"

Saturday 25th of October - 9.00 am to 12.30 pm .

Workshop moderator: Giuseppe Cartei
Rapporteur: Klaus-Rudiger Trott

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[26] *As also Andriolo pointed out: "I am speaking of the Alto Adige: a system for moderating the traffic has to be found as this is one of the most disastrous elements because the north-south axis passes through the Alto Adige region, and Austria is already opposing this by all possible means, even illegal ones; thereforem it's important to see to the construction of the railway, the Brenner tunnelm in a way... Now it has been approved, it has been inserted into the Provincial Government's environmental compatibility plan; in my opinion it's better not to open new zones, because now it seems... since the Volkspartei could achieve something under 50% and I don't think it could copy Stoiba's exploit in Bavaria, but the one in Innsbruck has touched 49, so it is trying to back off in all senses. The tendency is to open new zones, new valleys and this is something that is not for the best, because a large number of these new zones fail after a short time, because if they are not inserted into a circuit as ours are, they don't function and they ruin the environment - not because of the ski slopes: because, as we have seen, the slope in itself is relative, but because of the influx of tourism, and it is also to some extent a cultural matter, let's not lose sight of that too."*

Those taking part in the work group:
09.00 am – Giuseppe Cartei: Introduction.[27]
09.15 am Giorgio Palù: Man in the environment of viruses: benign or malign illnesses.[28]

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[27] *'There is a small change in our program: Prof. Palù has agreed to be first to speak. The work program is very simple: we will carrying out discussions after the introductions, in such a way as to provide a summary for the plenary assembly we shall be holding in the afternoon. You all know Prof. Rüdiger Trott, who has been with us in these days: he is our rapporteur.*
The round table is represented by Prof. Cadrobbi, who, as you know, is a specialist in contagious diseases, and head of the most important health organization of the Veneto: ARPAV. We also have Prof. Elisei here, representing the Endocrinologist Group of Pisa, one of the most well known in the world. Prof. Elisei has a great experience in thyroid cancers among Ukrainian children, and has worked on the issuing of official documents between the Ukrainian State and our own. We have Prof. Gion, whom our regional administration has entrusted with laboratory research on various pathologies, including cancers. We then have Prof. Palù, professor of Virology and Microbiology at the University of Padua and vice-chancellor. We have Prof. Marina Saetta, who is well-known for her pneumological studies on the genic impact of environmental changes, in relation to both benign and malign pathologies. We have Prof. Vecchia, an expert on electromagnetic radiations, whom I met years ago, when we had organized a congress on the causes of cancer. Prof. Klaus Rüdiger Trott is a well-known radio-biology researcher working at London. I hope he can make it here, even with a slight delay, which is caused by the transport systems of Salt Lake City, where he was attending the International Reunion of the American Association of Radio-Therapists. Dr. Fiorica will be discussing the negative effects of medical radiations on man'.

[28] *'Good morning to you all. Today, I will be discussing man and the environment, particularly from the point of view of viral infections. I will try to follow Prof. Cartei's instructions as far as possible, and offer an accessible paper, which includes the implications of the breaking of the inter-species barrier, of the new infective emergencies and also, partly, of bio-terrorism.*
Let me start with this headline from an issue of Nature published a few years ago: "Nature or nurture", i.e. "genetics: environmentally endogenous and exogenous causes in the spread of human cancers". I would like to apply this headline to the context of the evolution of infective diseases, by considering viruses as genetic elements, and causes of acquired genetic illnesses. This work referring to the old headline of Nature, was published in an old issued of the New England Journal Medicine, which assessed the general role of genetic illnesses in the development of malign tumours in man. So, a part from taking a few known syndromes into consideration, it pointed to the significant effects of genetic factors for some kinds of cancer: prostate, colon and breast cancers. However, as you shall see, it attributed the chief causes for the development of human cancer to the environment. This is the idea this short paper of mine shall focus on, with considerations on the environment and the risk of development of human cancers arising from factors such as smoking, diet, and everything connected to the diet (fat, lack of vitamins), selenium, ionic radiations – Prof. Elisei will later discuss the role of radiations in the development of thyroid cancer -, environmental pollution, pesticides, carcinogenic chemicals.... Undeniably, the World Health Organization considers HPV (helicobacter pilori) a direct carcinogenic agent. We might generally claim that 20–30% of human cancers arise from viruses, although viruses alone are not enough: so, we find HPV, heliobacter pilori, as a cause of uterine cervix cancers, of benign skin cancers and perhaps of oesophagus cancers as well. The polioma virus (SV40) is still a matter of debate today, but the World Health Organization will soon list it among the direct agents in the case of mesothelioma and other polioma viruses, such as BKJSI, Epseinbar HHV8, the herpes virus as an inductor, the Barkett lymphoma, nasal-pharyngeal carcinoma and various lymphomas: Hotchkin, B e T lymphomas of immunodepression, HHV8, caposi sarcoma, serous gland lymphoma and Kasselman's disease. Bear in mind there are about 500 million people infected by hepatitis C and B, which is an important cause of epatocarcinoma.
Here I have also included endogenous retro-viruses, since 5% of our genome is filled with these copialai sequences which can be activated through genic therapies. We have recently seen, in the case of three children from the clinical trial of Alain Fichère at Paris, that the activation of an endogenous retro-virus can lead to the activation of a proto-oncogen or cause transfer signals mediated by NFKB. The issue, therefore, is a rather complex one. It ranges from solid tumours to lymphomas and leukaemia; I have also quoted two examples: a bacterium and a protozoon in the liver and bladder carcinoma.
How does man affect the environment? Well, man is affecting, or has affected the environment, especially in the past years, in more affluent societies, changing the traditional ways in which nature defended itself, i.e. establishing the species barriers which are largely mediated by single receptors which make a host open to his direct pathogen.
In the case of BSE, Mad Cow Disease, we have altered nature by turning a ruminant, a herbivore, into a carnivore, by introducing alien foodstuff which the species had never know in the course of its thousand, million-year old existence.
The same goes for viruses: you can see how West Nile is the most significant, because it is a matter of debate in the United States, to the extent that the screening of transfusions is being discussed. We shall see what the epidemiology of this virus is: no doubt, with air traffic, with globalisation and climate change, we are contributing to the spread of the cules pipiens. Temperature increase turns stagnant water in swamps and ditches, and fills it with organic substances, and a better pavolum for these kinds of mosquitoes, and for the virus they carry, to reproduce in.
Ebola: in this case we are not dealing with a form of environmental infringement yet; what we have, as we shall see, is a limited rela-

tion between animals and man, which we still don't know how globalisation is going to effect. No doubt, influenza is what we should be most concerned about, besides HIV. You can see endogenous viruses, such as nipha and endra, carried by small primates in Thailand and Australia, with metapneumoviruses, which might be a cause of aggravation in the case of SARS, the Corona virus, the bunia Crimea Congo. In Slovenia, in former Yugoslavia, dozens of cases of this haemorrhagic fever were reported. So, a haemorrhagic fever at level BL4 sets our limit; we are not too concerned about this, but we do have about ten cases of this kind every year in Slovenia.
The Poxvirus simiae is another example: we thought it would wipe out smallpox; instead, its genetic similarity to monkeys' small pox allowed its passage to an African racoon, which transferred like pat in the United States, spread the infection.
Let me remind you of the impact of infective diseases on society, both the affluent world and the third world. In the third world, they are the major cause of death and of morbidity, whereas in more progressed society, in North America and Europe, they make up 8 and 11% of deaths and morbidity, being the third cause of death after cardiovascular illnesses and cancer. Here you can see a classification of the most common pathologies: pneumonia, which is not bacterial alone, of the community or hospital kind, but also viral, like SARS, or in the case of adenoviruses, the flu, diarrhoeal diseases, HIV and malaria. As you can see they are responsible for millions of deaths around the world. Epidemic forms exist, but these viruses are genetic, because most viruses, particularly in the case of herpes, herpes zoster and herpes simplex, can be found at all seasons. They are actual, contingent problems.
If we now were to turn to the role of emerging infections, we would notice how they are predisposed by changes which allow zoonosis to spread to man. Here we have the example of the zibet cat from Guandong, where a rural population lives in everyday contact with ducks and pigs, to which the epidemic was traced back through epidemiological analysis: from Guandong to the Hong Kong hotel, to Toronto, to the whole world. We are probably still unaware of it, but genetic analysis show how only 29 nucleotides differentiate the virus found in these animals from the Corona virus, which is the biggest human virus studied today. We know it as the cold virus, as the agent responsible for a new epidemic which might manifest itself in ways still unknown to us. We can tell it is a different virus from the ones we know, 2229 and OC43, which belong to group 1 and group 2; genetic analysis shows it is a genotype, a different type from the ones we know. It came in contact with man only recently, and we know this through serological studies. No doubt, this happened through an inter-species passage, perhaps through the zibet; from research on the bronchitis virus of chickens, we know it can pass from chickens to pigs. What environment would be more apt for the chicken bronchitis virus than the rural areas of China, with this intense human/animal cohabitation and density of population? The contemporary transport civilization aids the spread of the virus, so what is happening in Guadong might occur in Hong Kong and Toronto the day after. So much for epidemiology. I would just like to add what we know from the archive studies of the AIDS epidemic: no doubt homologies with the Simian Imunodeficiens Virus (SIV) trace the spread of the infection from a chimpanzee, the pantroglodites, to man, via tribal rituals involving the sprinkling of blood. The virus came in contact with man as something new. Among chimpanzees we find cohabitation; the passage from one species to another is rare event. The virus might spread because the species is not an apt one. In man, the replication of a lentivirus led to the death within a few years.
Today, evolution is changing. As this picture shows, there are about 40 million people suffering from AIDS today, 4 million people dying each year, and around 3 million infected children. This is mostly occurring in sub-Saharan Africa, in eastern Asia and in the former USSR. The virus is changing, and we ought to keep checking it. The kind we new, subtype B, is spreading among the Asian and African population with a number of recombinants. According to statistics from Padua, 97% is still group B, but we are currently facing a stock archive of 1000 genotypes. I believe the situation in the rest of Italy, where analyses have been carried out on a larger population, is higher, around 10%.
It necessary therefore to check these genetic changes, since they also affect reactions to drugs.
I would like to mention the case of an epidemic which broke out in the United States a few years ago: the hantavirus, bunia virus, another RNA virus, more complex and smaller, with three sub-genomic portions. The disease was a serious pneumonia, which passed from rodents to man in the so-called Four Corner region, at the crossroads between Utah, Colorado, New Mexico and Arizona. The first victim was infected in the Navaho reserve. Here you can see how thousands of cases of this new epidemic are attested. We had first encountered it during the Korean War, but it now spread to the United States, and is also found in eastern Europe.
Other environmental modifications are caused by climate changes, by the spread of certain coolex species by plane. These arrive with planes, unloaded with cargoes. The mosquitoes hatch in stagnant waters, and we also ought to check them for the spread of malaria; but today this coolex species found an environment – birds – which is most apt for the spread of the virus, The rise in temperature in the United States aided the proliferation of this species, the coolex or salivarius, which can infect birds, men, and feed on man and animals. The West Nile fever, which used to be confined to this area, Mediterranean Europe, to Egypt in particular, and which might have even killed Alexander the Great, has spread today to the opposite shore of the Atlantic. This, then, is what is going on. Look at the number of cases in the United States: last month, New England proposed a screening of blood samples for blood-donors, because of the attested cases of West Nile through transfusion.
Allow me now to discuss the influenza virus, since it has been with us for more than one century. Archive studies show that the virus might have been present in the XVIII century; certainly, it existed at the time of the Mongols, and perhaps earlier still. What is so characteristic about this virus? Beside the annual epidemics, for this is a circulating virus, which changes into a single amino acid, hemoglutinine or neuroaminidasis, we have also encountered, from 1918 to 1957, to 1968, to 1977, pandemic forms. These pandemic forms are caused by the re-assortment of viral genes, which are here shown: the first three are polimorasis, HL emaglutinine, NA neu-

09.30 am - Paolo Cadrobbi: Environmental information and the protection of health.[29]

roaminidasis, the nucleus protein, the matrix protein and the genes for the non-structural protein. In the case of co-infection in an aviary species such as ducks, which migrate from Siberia to the Cinese seas, and there dwells in marshes, like Guandong near Hong Kong, the ducks are not themselves subject to the infection, but infect the birds through their faeces. The species barrier works, because hemaglutinine binds with sialic acid, which can be combine with galactose through Alfa 2-3 galattosidium or 2-6 galattosidic, so we have 2-3 in the aviary species and horses, 2-3 and 2-6 among pigs, and 2-6 only among humans. Pigs, then, can re-assort the genetic ability of the virus to recognize his natural species. This re-assortment took place first in the aviary specie, and then it passed over to pigs and humans. This is what happened in 1957 and in 1968 with the Hong Kong flu, which is the one which is still spreading; it occurred in 1997, passing from geese to ducks, from ducks to chickens – ypeople in Hong Kong keep chickens in their houses. The virus soon spread in the city: in 1997 18 cases of H5 N1, duck's hemaglutinine, were reported. This is the first time a passage from the aviary specie to man occurred directly: the passage from one species to another was immediate, not mediated by a mixing vassal such as pigs. We are talking here of 18 deadly cases: luckily the virus did not spread to the human population, probably because it did not possess a selective advantage mediated by the reception barrier. The Chinese authorities also intervened promptly: as in the case of SARS, they confined infected subjects, killing, in this case, all the chickens. You can imagine then the environmental situation. This year, we had the Cassette N7, an old virus which had shown again a inter-species passage, passing from seals to a veterinary, thus revealing a close contact with man. In this case, it passed from hens to humans: a veterinary died in Holland. One ought to be aware of this, because the virus, H5 N2, can also be found in our country, in the aviculture milieu of the Veneto. We ought to check the situation and be aware of the risks we might be running.

My paper being about 'malign diseases', I haven't focused too much on oncogenous viruses; you know these well. Whether an illness is benign or malign is a matter of mortality. These are mortal illnesses, or can be mortal illnesses, so should we fear a bio-terrorist attack? Of what kind? An attack based on easily manipulated viruses: Ebola is not one these viruses, buy the pox virus is, the influenza virus is, just as bacillus antracis spores can be easily manipulated, and spread through the air. Prof. Saetta will later explain why Ebola is so dangerous: I already mentioned in this case we are facing a level 4 risk, i.e. operations in a confined environment with a protection suit; at our boarders we already find the bunia virus Crimea Congo; so perhaps Ebola is not spreading, but this doesn't mean it might not, through some safari or exploration trip.

To sum up, the changes man made to the environment ought to put us on alert: as I tried to show through a series of examples, it is possible, through the use of viruses, to break the species barrier which has being existing for millions of years on our planet, and has safeguarded us from animal to human cross-infections.

The planet's environment is changing because of the greenhouse effect, of the alteration of water courses, and of its temperature, since an increase of one degree is enough for a virus to develop in a new species of mosquito. Our role is that of carrying out strict diagnostic, microbiological and virological controls, as well as epidemiological monitoring – which is how the World Health Organization managed to contain SARS –, and a control of all risky behaviour in terms of the breaking of the inter-species barrier, and of environmental contamination and modification. Most importantly, we have to start thinking in different terms, not only by diagnosing these illnesses, but by preventing them, for viral infections must be prevented. In terms of new therapy techniques, given the presence of Prof. Cadrobbi, I would like to mention the fact that soon we will be presenting the European Union with a project focused on the study of the influenza, Crimea Congo and West Nile, which hypostatises them in epidemic form, in order to try and prevent them and to develop new vaccines and drugs. Through our contacts with the World Health Organization, the United States and the European Union, we hope to provide the regional administration – perhaps within the next ten years – with a structure for the prevention of this infection. Thank you.'

[29] *Head of the Environmental Agency of the Veneto.*

'My paper is certainly less highly imaginative than Prof. Palù's; it is more descriptive, and made up of less beautiful images.

I would like to briefly discuss the institutional characteristics and nature of the Environmental Prevention and Protection Agency of the Veneto (ARPAV), which was first established five years ago, after a law had been passed through a popular referendum, which removed environmental controls from the jurisdiction of health services. Today, ARPAV deals with all controls of the physical, biological and chemical environment, of air, water, soil and foodstuffs, which it constantly monitors, thus acting for the protection of our common health from environmental pollution, as required by its very regional foundation law.

According to various methods, it constantly carries out controls on atmospheric pollution and on physical pollution caused by noise, radiation, electromagnetic waves, systems of disposal of urban solid waste and toxic, noxious waste, and on water for human consumption. Talking about drinking water, yesterday at Warsaw we began discussing an agreement with Poland, a new nation to enter the European Union, to provide them with all the Italian and Venetian laws issued to preserve the quality of the water man needs. ARPAV, however, also analyses the quality of bathing waters of swimming pools and of urban, production and sanitary drains, and that of plant-based foodstuffs for any trace of pollution.

I cannot describe all the consequences of the alteration of the standards to be respected, in all the various fields the Environmental Agency is concerned with. I will limit myself to listing a few facts on atmospheric pollution, and on the actions which are carried out to keep it under control.

Atmospheric pollution is caused by emissions from natural sources; wind alone, even at a distance of thousand of kilometres, can transport soil particles across the air. We have all seen, for instance, how a car, in certain days of the years, can be covered by a veil of sand from the Sahara desert. The most dangerous emissions are those of industrial productions, of thermo-electric energy production, and those of traffic; combined, they have a significant impact on human health.

Besides monitoring atmospheric conditions, then, the Agency focuses on the spread of information. This is regular spread, which takes place every day on an internet site, which is among the most visited sites in Italy: www.ARPA.Veneto.it. Here one can find all the information on the things I have just mentioned.

Starting from late May, since it is mostly a summer phenomenon, punctual, hour by hour information on ozone pollution is included on the site. This is now over, but from November 15 new operators will become active in the Veneto, providing information on the level of dust particles. They will provide official data to the municipalities, local administration and provinces, which will allow them, thanks to the technical and scientific support of ARPAV, to take the necessary decisions, concerning for instance the closing off of urban traffic, and other decisions which should help keep pollution under control. Which are the most dangerous pollutants, and which are the less dangerous ones? We find so-called conventional pollutants, but today we also have other, non-traditional pollutants, which are perceived as particularly dangerous. So we find dust particles of the size of less than 30 micrometers, PM10, which measure less than 10 micron, and dust which can be inhaled, so-called breathable dust particle, which reach the lungs' alveoli, which measure less than 2,5 micron. We also find ultra-thin dust particles, which measure less than 0,1 micron, and which we are beginning to study, although our means of observation are still insufficient.

Benzo(a)pyrene is another important substance. It come in various kinds: bezo(a)pyrene is the most common among policyclical aromatic hydrocarbons, and is certainly carcinogenic. Likewise, benzene also has a carcinogenic effect: it is the made up of a single ring with 6 carbon atoms. These are all new, non-traditional pollutants. Among conventional pollutants, we find nitrogen bioxide, sulphuric bioxide, carbon monoxide and ozone.

Why are these particles of dust in the air dangerous, and why should we check them? Because they have a heterogeneous composition, and can contain allergy-causing substances such as pollen in spring and summer, but also sand, small quantities of material from the land, with carbon, lead, nickel, nitrates, sulphates, the volatile organic compounds I previously mentioned, and particles from diesel exhaustion fuels. According to their size and origin, we are likely to find variations in the composition of these dust particles.

The main sources of these emissions are road traffic, especially diesel vehicles, heating, energy production in power plants and open-air combustion: even a forest fire produces these dust particles. As for their health impact, they can cause short-term reactions, which appear a few days following the presence of a pollution peak, particularly with the irritation of the respiratory system, bronchial constriction and asthma, cough, cardiovascular problems, such as an increase in blood viscosity and coagulability problems, as well as tachycardia attacks. The chronic exposition to these particles can cause serious damage to the alveolar cells, following the release of various substances absorbed by the particles, even with carcinogenic effects. What I previously said can be applied here as well: the dimension and diameter of the particles, the natural sources, the erosion of the soil and of buildings by natural and meteorological phenomena, and anthropic sources above all.

Bear in mind that these PM10 particles, which measure up to 10 micron, between 30 and 10 micron, can remain in suspension in the atmosphere for 12-24 hours. Those which measure less than 2,5 micron can remain in suspension for up to one month. The only elements which can determine a reduction are represented by climatic changes, i.e. by strong winds and rain.

Various studies have been made, both on their short term and long term effects on health. The APHEA 2 or Air Pollution Health study was made undertaken between 1990 and 1997 in 29 European cities; among them, big cities like London, Paris, Madrid and Rome. Both dust particle below 10 micron and traditional pollutants such as sulphur and nitrogen bioxide, and ozone were taken into account. In another, American study, the National Morbidity Mortality and Air Pollution study, which examined the years between 1985 and 1994, took nearly all major American cities into account and studied again PM10 and other traditional pollutants. An Italian meta-analysis of the studies on the short-term effects of atmospheric pollution took into consideration a whole series of studies carried out, more or less on the same pollutants, between 1995 and 1999, in major Italian cities: Rome, Milan, Bologna, Florence, Verona, Ravenna, Palermo and Turin. As for the outcome of these main studies on the short-term effects of atmospheric pollution, we find a few differences between the various studies, which, however, all confirm the existence of the problem. Mortality rates for natural causes are on the rise, as a consequence of these short-term effects of pollution. According to the MISA the rate is of 1%, according to the European study APHEA 2 it is of 0,6%, and according to the United States study, it is of 0,5%. Both MISA and NMMAPS signal a growth in cardiac pathologies, and show how breathing pathologies might rise from around 1,2 to 2%.

Three big studies have been made, spanning 5-6 years, or even 10 and 14, on long-term effects. One of these studies is the so-called six cities or Harvard study, which shows an increase of 14% in PM2,5 values, which rises to 9,2% in the case of dust particles of a greater size. The American Cancer Society study: 6% for PM2,5, 8% for the same pollutant in the case of cardiovascular mortality rates. The American Cancer Society study focused on around 1.200.000 people, which were examined through questioners, where a whole range of elements, including the habit of smoking or various pathologies, were taken into account.

The Seventh Day Adventist's study, which was carried out in California, focused on about 6.000 people for several years. It pointed at an increase of 4,6% in the natural mortality rates among males caused by PM10, and of 4% for cardiovascular and breathing ill-

nesses. It would seem like the phenomenon affects females less. The study on the Arden lung cancer shows how each increase by 10 micrograms for square meter of PM2,5 is connected, in the long run, to an increase of mortality rates for all causes by 4%; we are talking here about natural mortality rates, mortality not caused by accidents, traumas, etc.: in the case of all cardio and pulmonary illnesses it rises to 6%, and in the case of lung cancer to 8%. The most significant cause of lung cancer caused by environmental factors is still cigarette smoke. In the United States, out of around 250 million inhabitants, there are 158000 cases of lung cancer, 81 to 95% are caused by smoking. Around 9% are caused by radon, which is one of the many things the Environmental Agency of the Veneto is studying.

All areas have been mapped, particularly those of the hills around Vicenza and a few in the province of Padua and Belluno; we believe there to be around 50 or 60 cases of lung cancer caused by radon in the Veneto. What is most evident, is the fact that in the houses where radon can be found, and people have been living for a while, the frequency of lung cancer is higher among those who smoke.

Let me briefly describe the characteristics of these pollutants, the so-called PIA or Policyclical Aromatic Hydrocarbons, which basically derive from the unfinished combustion of various organic substances. They are to be found in the city air, especially in the air of big cities; we know that in most cases they are particles which measure less than 2,5 micron, and which can reach the alveoli of the lungs. They are usually emitted by motor vehicles, from diesel engines and urban buses in particular, by thermal plants and power plants and incinerators.

Only a few weeks ago, before the closing of the power plant of Porto Tolle and the black out, a magistrate asked ARPAV to monitor the local area for pollution, in order to evaluate whether the closing of the plant had lowered the maximum level of emissions. The study had to be interrupted immediately with the black out, for the plant had to be re-opened to avoid further risks. We will, however, carry it out again.

The more carcinogenic substances are class 1 substances; benzo(a)pyrene, the prototype for Policyclical Aromatic Hydrocarbons, has certainly a carcinogenic effect on the lung. Benzene is another chemical substance with a single ring, which increases the number of octanes, and has a detonating effect. I have always asked myself why lead was removed, since it is no doubt a toxic substance, but it was replaced by benzene, as an anti-detonating substance, which is certainly carcinogenic. People have begun to observe this phenomenon, however: today, in Italian petrol the amount of benzene is constantly decreases, and subsequently, the level of benzene in the air is also decreasing. In any case, it is a 1st level carcinogenic substance which can cause various kinds of leukaemia.

As for conventional pollutants, they usually have an effect after a brief period of time following their emission, and mostly acute effects; however, they also have long-term effects, such as a rise in breathing illnesses, with an irritation of the mucous membranes of the breathing system, which make them more susceptible to the viruses Prof. Palù described; a cellular and tissue alteration of the lungs; an increase in susceptibility to infections, particularly in the case of children and people who suffer from asthma. The same goes for sulphur bioxide, which causes more or less the same kind of alterations, i.e. an increase in sensitivity to external agents, an increase in bronchitis, coughs, asthma and so forth, and, as for long-term alterations of the functionality of the lungs, a worsening of chronic bronchitis, asthma and emphysemas.

There are many substances, then, which ought to control. This is the work ARPAV is carrying out through a complex monitoring network, which checks the quality of the air, and is made up of operators – which I shall later discuss. This network is constantly renewed through campaigns based on mobile operators and passive samplers. When the accident in Porto Marghera occurred, and an industry caught fire, it was a particularly busy night: all these people had to contain these volumes of air in order to check whether they exceeded certain values or not. Evaluations were carried out with mathematical dispersion models; this data was later gathered, studied, and simulations at a distance were carried out.

This is the distribution of the various operators in the Veneto. There are 60:31, situated in strategic areas in cities, particularly in the bigger cities, to measure the level of traffic pollution. We then have 29 in suburban or rural areas, to measure pollution.

The regional administration of the Veneto approved a project for optimising the monitoring network. It currently about to be implemented. If we now turn to the annual average PM10 levels found in the various provinces of the Veneto, we can see how from the first of January 2005 we will have passed the topmost level, the exceeding of which was bring all traffic, or at least heavy traffic, to a halt, with serious consequences for the transport of good and people's activities. This is also the case with cities like Belluno and Treviso, which enjoy particularly favourable atmospheric conditions: they still exceed the average annual level of 40 micrograms/m^2.

As for conventional pollutants, nitrogen bioxide and ozone can exceed limit values, particularly in the summer; sulphur bioxide and carbon monoxide seem no longer to exceed what are considered tolerable levels of acute concentration. Fine, non-conventional particles, as I showed in the previous slide, present high levels of concentration, particularly in winter, and when there is little wind blowing. The level of benzene seems to have decreased in the past few years, given less is to be found in petrol.

So what is the role of the Environmental Agency in controlling these phenomena? We carry out surveys, monitoring activities and analyse environmental data; we are currently trying to establish a more integrated collaboration with sanitary structures, given the fact that, according to certain political or even professional views, since many physicians or people with juridical expertise came to work for ARPAV, the separation of environmental controls from health services with the recent referendum seems to have separated the goal of environmental protection from the consequences it bears on human health. What I believe, is that a citizen might be glad if a palace such as the Ducal Palace is protected, given its beauty, but that he should also be concerned for the air, water and other ele-

09.45 am - Rossella Elisei: Negative effects of ionic radiation on the thyroid.[30]

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ments which make up the environment he lives in, since they bear direct consequences on his health, for instance through various alterations which he might not perceive, since fine dust particles are not visible. What we are doing then, is trying to connect the information on the pollution of the air to an evaluation of their effects on the population's health, to prevent the pathology pollution might cause.

It is also worth mentioning the fact that we are attempting to provide a vaster distribution of such quality information as quickly and clearly as possible, since both the press and television, both means of information, are looking for shocking news, scandalous news, the chemical news item of the week. Actually, information oughtn't be alarmist, it should be exact. We are establishing specific form of collaboration with medical services on various issues, in order to reach some conclusions on the studies underway. We cannot provide the results of any of these studies yet, with the exception of a few preliminary results, since the Agency has only recently begun to take this path; it is a difficult path, which is often little followed by those who should provide funding for it.

Two studies exist: one is on urban atmospheric pollution and health in the municipality of Padua, an analysis of the short-term health effects related to traffic. It is currently underway in the municipality of Padua, and focuses on the impact of traffic on health. It is being led by the Department of Environmental Medicine and Public Health of the University of Padua, and financed by the Ministry for the Environment. The other study is being conducted in Venice on children; it involves the Department of Environmental Medicine and Public Health of the University of Venice, Padua University, and the ISPESL of Venice. A monitoring plan has just been started a few months ago on the whole area of Porto Marghera, which, as you know, is an high-risk industrial area. The name of the plan is SIMAGE; it attentively measures the pollution level of atmospheric pollution in the Venice lagoon and in all rivers, waterways, etc. which flow into it. A pollen monitoring network is about to be completed, and is already active. As I mentioned at the beginning, pollen can make up part of the atmospheric particles which measure less than 10 microns, and cause allergies, particularly in spring and summer.

To sum up, the Environmental Protection and Prevention Agency focuses on the protection and recovery of the environment, on prevention, and on the promotion of collective health, according to its 1996 foundation regional law. The reduction of carcinogenic substances depends on the quality of the environment man lives in; for this reason, we believe that the protection of the environment means an effective protection of human health. I hope not to have exceeded my one-hour limit. Thank you.'

[30] *'I would first like to thank the organizers of this conference, and send you all Prof. Pinchera's regards. Prof. Pinchera has been working on the effects of ionizing radiation on the thyroid for years; in our Institute, we are studying the same thing with great interest. Ionizing radiation – I believe you have heard about it, and that you'll hear about it quite a lot in the course of this conference –, besides natural, cosmic and radon radiation, basically derives from two specific events: environmental disasters, such as nuclear incidents, the explosion of atomic bombs and nuclear warheads for experimental purposes, and ionizing radiation which is employed for therapeutic purposes, but which bears both positive and negative consequences. In both cases, these kinds of radiation can cause certain effects through an external and an internal exposure. External exposure, in the case of radiation caused by environmental disasters, is connected to the immediate exposure to the radiation itself; in the case of therapeutic radiation, the most common example is that of external radiotherapy, which is some times used in the treatment of cancer.*

As for internal exposure, in the case of radiation caused by environmental disasters, it chiefly caused by the so-called radioactive fall out, i.e. by whatever man ingests or inhales following the contamination of the environment, including contamination of the food produce of the fields, the air, etc. As for internal exposure due to therapeutic radiation, the most usual case is that of iodine 131, which is used in nuclear medicine to cure certain kinds of cancers, such as thyroid cancer.

The fact that ionizing radiation can be a cause of cancer in humans has long been known. Generally, leukaemia, in one of various forms, is the illness most likely to develop soon after exposure to radiation. However, years after the exposure, several other kinds of cancer can develop. The thyroid, which is an endocrine organ on the neck, in front of the jugulum, is particularly sensitive to ionizing radiation for two reasons: the first, is because its cells possess a conveyor on their surface, a sodium-iodine pump, which allows the active entry of iodine through the cells; the pump cannot distinguish natural iodine from radioactive iodine, and allows the passage of both natural and radioactive iodine in the cells. The second reason, is that thyroid cells are also generally sensitive, especially during the period from infancy to adolescence, to radiations and the damages they can cause: during these years, the cells are actively reproducing, and only cease actively reproducing when one reaches adulthood.

Since the 1960s, it had been observed that people exposed to external radiations on the neck or the head for the treatment of benign illnesses – I ought to mention here that in those days even illnesses like Tinea Capitis, face angioma, tonsillitis and adenoids were cured through the use of radiation, and this was an extremely common procedure – were likely to develop thyroidal nodes; cases of thyroidal carcinoma were particularly common among people externally exposed to radiation. The likeliness of developing thyroid cancer was directly proportional to the level of radioactive exposure.

Besides these damages caused by external radiationn used for therapeutic purposes, we also find thyroidal damages caused by nuclear

incidents, nuclear disasters. No doubt, the first and most significant of these disasters was caused by the atomic bomb, i.e. by the exposure of people in Hiroshima and Nagasaki to the radioactive substances released by the explosion. Among the various pathologies, those affecting the thyroid were the most studied among people who survived Nagasaki. A general increase in illnesses of the thyroid was observed, an increase of thyroidal nodes, of thyroid cancer, and of other pathologies of the thyroid, such as hyperthyroidism, i.e. a reduction in the functioning of the thyroidal gland, which is basically connected – and I will later come to discuss this – to the development of antibodies which attack the thyroid and reduce its ability to function.

If we were to compare the condition of people exposed to radiation through the atomic bomb to that of people exposed through a radiation-based therapy for benign pathologies, we would notice how the likeliness of the former to develop thyroid cancer, albeit at a rather high level, 4.7, is still inferior to that of the latter. This concerns people below 20 years of age, people who, as I mentioned, are most sensitive to radiation-induced thyroid damage; this, instead, shows the risk run by adults: again, you can observe that it is inferior to that run by children and young people, and still inferior to that run by people therapeutically exposed to radiation.

Another unfortunately crucial event for the thyroid and the development of thyroid cancer, was the Chernobyl accident, the Chernobyl nuclear explosion. From the point of view of the various reactions, this disaster was rather different from that of the atomic bomb: here many radionuclides were released, and iodium 131 in particular. Although we still lack the necessary documentation, we believe this to have been the cause of the thyroid cancers I shall later describe.

Following the nuclear accident which took place on the 26th of April 1986, and the winds which spread the toxic cloud which contained a certain amount of these radionuclides, all these substances spread to the areas surrounding Chernobyl. Around 1990-92 the firs increase in the incidence of thyroid cancer was documented, particularly among children living in the surrounding area. As you can see in this table, children between the ages of 0 and 14 presented a greater incidence of thyroid cancer than the one registered in the years before the accident; the same increase was also documented among adolescents and adults, albeit in at a lesser extent. Specific studies were made on Belorussian children. Although the Chernobyl plant is in Ukraine, it is on the boarder with Byelorussia, and following the shift of the toxic cloud to Byelorussia, the country was struck by the fall out. The accident occurred in 1986, but from the years 1990-1, the incidence of thyroid cancer among children under 15 began to rise, and only to diminish, in the case of children, around 1997; in the case of adolescents, it is still on the rise, since those who had witnessed the nuclear accident as children have now grown.

If these were the effects on Byelorussia, which, as I mentioned, was no doubt most stricken area, what happened to the other contaminated countries of the former USSR? Well, the same phenomena can also be observed in Ukraine, where the percentage of thyroid cancer among children and adolescents also increased. One problem is to determine whether this was an actual event, or whether the documented increase was merely due to a greater focus on the pathology, i.e. a screening matter, as it would be technically defined. Actually, the increased percentage was too significant to be a mere screening matter. This is what also happened in Russia, with an increase of cancer among children, adolescents and young adults. If we compare the three countries, we can see how Byelorussia is where the phenomenon manifested itself most significantly.

What kind of cancers are we dealing with? Are they the same kind of cancers which develop naturally? We have compared the cancers of Belorussian children with those of a group of other children, Italian and French, and observed a number of differences in terms of histology, that is to say: the typology of thyroid cancer; among Belorussian children the papillary kind was more common than among the Italian and French children, where the follicular kind prevailed. So the kind of cancer induced by the Chernobyl radiation was more frequently papillary. When the diagnosis took place, the cancer was larger, and thus more aggressive, among the Belorussian children. If we then compare the various treatments, however, the remission, healing percentage was complete in both cases.

One question raised was whether similar phenomena can be found in other European countries which the cloud reached in the days following the accident. Although we lack any official study, no increase in thyroid carcinomas has been reported.

A study led by an Italian group from Milan is currently being published. It examined about 3.500 children born between 1985 and 1986, in the years immediately following exposure to the toxic cloud, to check for thyroid nodes. The study seems to have shown that the percentage of thyroid nodes among these children is not significantly different from that among children born before the accident. It would then seem that, at least in Northern Italy, the toxic cloud had little direct effects on the thyroid.

Let me now mention another thyroidal pathology connected to the toxic cloud of Chernobyl: by studying the Belorussian children, we have observed how children living in contaminated villages presented a significantly higher percentage of anti-thyroid antibodies. The statistical differences between the village of Hojniki and the less contaminated village of Braslav is extremely significant. So, children more exposed to radiations showed auto-immunisation phenomena to a far greater extent than less exposed children. This also holds true for Ukraine, and, at least partly, for Russia: as in the case of cancer, the children most struck were Belorussian, followed by Ukrainian and Russian children.

Did the nuclear accident have any other consequences? It would seem like it hadn't in terms of blood illnesses, but perhaps it is too early to judge. We should observe these populations for several other years. No doubt, other damages occurred: besides those due to immediate exposure and thyroid damages, the population of these areas suffered from other forms of damage from the biological one.

10.00 am - Massimo Gion: Do biomarkers for the assessment of damage caused by occupational oncogens exist?[31]

They no doubt suffered psychological harm, since they are still living in the fear of being contaminated and of feeding on contaminated food. An increase in depression and alcohol abuse has been documented.
To sum up, we might say that the thyroid gland is particularly sensitive to radiation damage, particularly in the case of children. Certainly the Chernobyl disaster caused an increase in thyroid cancers, although with a clinical trend luckily similar to that of spontaneous cases of cancer. At the present moment, no increase in other kinds of cancer has been observed, but the population ought still to be monitored. We have witnessed a significant increase in auto-immunisation phenomena among those exposed. At the present moment, it no increase in thyroid illnesses has been reported among north-Italian children born in the period immediately following the nuclear accident. Thank you.'

[31] *'Good morning to you all. I would like to thank the organization for having invited me to this important conference.*
I would like to deal with a rather specific problem: the approach to the study of the relation between the environment and illnesses. We can study this kind of connection in two ways: through a classic epidemiological approach and a molecular epidemiological approach. Classic epidemiology is based on demographic data and clinical information, and aims at defining the causal relations between an event and a given illness. Molecular epidemiology is instead based on the evaluation of biomarkers. The evaluation of biomarkers aims at studying the biological base of relations between a given event and an illness by identifying biomarkers which can define environmental and occupational exposures, and monitoring the efficacy of the control of exposition, and to foresee the likeliness of a given illness. What is the rationale behind molecular epidemiology? Basically, molecular epidemiology is based on the knowledge of the functioning of genotoxic carcinogenics, which make up a vast category of chemical substances, which all have a high chemical reactivity in common. This reactivity is due to the molecules' hunger for electrons; the molecules can become hungry for electrons thanks to specific enzymes we shall later discuss. These reactive molecules, which are attracted by electrons, interact with biological molecules, such as nucleic acids and proteins, and make up the so-called adducted covalents. The adducted covalents can bind with DNA and cause mutations, which can give way to neoplasia.
The metabolism of genotoxic agents is regulated by groups of multigenes which can act in two different ways. Firstly, they can turn non-toxic substances into toxic ones, or transform toxic substances which can be detoxified by making them water-soluble and extractable through bile and urine. Basically, what happens is that that the possibly carcinogenic substance can be detoxified, made metabolically soluble and safe, and expelled; it can be metabolically activated and turned into the definitive carcinogenic substance. This carcinogenic substance can be further transformed through detoxification mechanism into metabolites which can bind with DNA and give way to a mutation, which can further be corrected through reparation mechanism, or give way to a process which ultimately leads to the creation of a neoplastic cell. The pre-carcinogenic substances are then turned into reactive compounds and detoxified through two different methods with so-called phase 2 and phase 1 enzymes.
Where are biomarkers to be found in this complex, although apparently straightforward, chain of events? Biomarkers can be found in three different areas: among enzymes, DNA ties and biological molecules or mutations. Basically, the study areas of biomolecular epidemiology are exposition biomarkers, i.e. adducted covalents, individual susceptibility, i.e. those enzymes which protect a given substance and make it heavier and more dangerous, and, lastly, precocious carcinogenic markers.
Let us briefly deal with these two issue. Exposition biomarkers, as I mentioned, are molecules toxically formed, which bind covalently to DNA or proteins. Various analytical methods have been developed to measure these substances, which possess an important quality: they diminish variability in exposure data, which is typical of the environment; therefore, they can provide us with integrated information for a long period of time, according to the level of exposure. What advantages do they offer in terms of epistemology? They can provide us with information of all the various means of exposure, since they represent an internal cumulative signal. Somehow, they can balance both exposure and metabolism inter-individual variability, and reduce our monitoring effort. This first group of markers is important for the identification of the close relation between immediate, recent exposure and the subject exposed.
We then find two other kinds of biomarkers: individual susceptibility biomarkers and carcinogenic effects biomarkers. Let's start from individual susceptibility biomarkers. Before, you have seen the tow red and green squares, which represented two different kinds of enzymes; we have called these two groups phase 1 and phase 2 enzymes. Phase 1 enzymes are of a different kind; the most important among these belong to the large family of cythocrome P450. Usually, these enzymes introduce and unmask the functional group of the substratum; they tend to turn the substance of the substratum, even if it is inactive, into an active substance, since they highlight and strengthen its chemical reactivity.
Phase 2 enzymes, we might say are better enzymes, since they tend to transfer toxic substances by accompanying them with other substances or mechanism capable of reducing their level of toxicity or of increasing their solubility, and thus the likeliness of their excretion. Let me explain why these enzymes are important. They are important because of polymorphism. Polymorphism is an alteration of the DNA sequence, which can naturally take place in various individuals, and does not usually cause any damages to the general functioning of the protein or the family of proteins. Why is this phenomenon important in this kind of markers? Because polymorphism, both in the expression of both phase 1 and phase 2 enzymes can increase susceptibility or resistance to cancer.

Let us now discuss the third category: precocious biomarkers of a carcinogenic effect. These are even more removed from monitoring. We know that the mutations or hyper-repressions of oncogens or oncosuppressor genes play a role in the development of neoplasia caused by environmental or occupational factors. What are oncogens and oncosuppressors? They are genetic interrupters within the cell; if they function correctly, they allow the cell to develop in the expected way: in the case of a dead skin cell, for instance, to flake off and cease to exist. When they break or loose control, however, the normal cell turns into a cancer cell. Bear in mind this is a simplification of an extremely important concept.

The mutations which affect these oncogens and oncocompressor genes, i.e. these interrupters, are compatible with the mutation which cause the development of DNA adducted covalents: a close chemical relation exists between immediate toxic effects and the biochemical damage which can precede the development of neoplasia.

Actually, these biomarkers do not specifically focus on the development of neoplastic illnesses: they can be a precocious marker of the risk of cancer development; they don't necessarily lead to the development of cancer, but can represent a precocious kind of damage. Taken alone, they do not specifically reveal any kind of damage caused by a chemical cancerogenic process: they only reveal it when they are associated with information on exposure, or compared with the levels present in those who were not exposed. Why did I mention an occupational carcinogenic process? Because I believe it to be an extremely important model for the study of the biological effects of xenobiotics, the external chemical substances we ingest. Why are they an appropriate model? Because the subjects exposed can usually be well identifies. Secondly, because we often know the exposure dose, since environmental situations are often recorded, thus allowing us to determine the dose of exposure. We possess quantitative date on exposure. Lastly, because these people usually follow accurate therapeutic protocols which allow us to know their case history. Unfortunately, since I doubt any of these people is glad to act as a model, exposed persons contribute to our community as a model providing important information.

We are dealing with two well-known occupational oncogenous substances, monomerous vinyl chloride and asbestos, for contingent, local reasons. As you know, vinyl chloride has been used in the polymeric industry for years before its links to the development of cancer, of hepatic angiosarcoma, proved by numerous studies, was discovered. We actually possess various up-to-date meta-analysis – here I will refer to a recent, 2003 one – which reveal the risk of hepatic angiosarcoma, which is well-known, and how the substance increases the risk of hepatocellular carcinoma and of cancer of soft tissues in those exposed; it also increases, albeit not significantly, lung, brain and hemopoietic system cancer mortality rates. There would seem to be no link to other kinds of neoplasia.

Which are the susceptibility markers for this substance? This substance is a rather important marker for double metabolism: on the one hand, it is activated by the cythocrome system, and later deactivated by the glutation transferase system. Therefore, it is the kind of substance which can take various paths; according to what? According to one's luck in having one kind of enzyme rather than another. This is a typical case in which the population will not all react in the same way, but according to its state of activation of the defence and detoxification system, which depends on one's genetic make-up.

What do we know about biomarkers of carcinogenic effects? We know that this substance causes mutations in K-ras and P53, i.e. in an interrupter which should not be active and in an interrupter which should remain active in a normal cell; we also know that a direct link exists between the activation and deactivation results of these interrupters and the dose. When an alteration of these genes takes place... you know that genes produce proteins: well, when the proteins produced by these altered genes start circulating, they behave in a different way from the proteins produced by normal genes. We can measure them, and have seen that an alteration in these genes causes the release of altered proteins according to the dose: it is interesting to study the proteins in this pathology, since the given dose leaves enduring marks over time.

We have then focused on asbestos. We all know that asbestos is made up of a series of minerals of great interest, for their reliability, which have been used in many industries, until its genotoxic character, which damages the DNA and can lead to cellular replication, chronic inflammation and so on up to malign transformation, was discovered. As we all know, a close link exists between exposure to asbestos and the incidence of malign mesothelioma. Are there any susceptibility markers for asbestos? The case is less well known that that of monomerous vinyl chloride, but the codification gene for glutation transferase, a cleaning enzyme, causes a greater incidence of asbestosis. This might be caused by a reduce ability in those subjects of detoxifying asbestos itself, or, perhaps, it constitutes a reduced capacity in the response to inflammation. We should actually observe how this polymorphism is a rather frequent phenomenon, found among 30 to 70% of people, according to the various ethnic groups; so it is not a rare case study, but a common one: the population can be interestingly studied to assess the links between asbestos-induced illnesses, mesothelioma and genotype.

As for biomarkers of carcinogenic effects, the increased levels of the proteins of P53 and K-ras, the same interrupters I just mentioned, the same genes just discussed, increased in the case of exposed subjects. The growth level of these proteins seems directly linked to exposure. Not only that, but another protein, and other growth factors, i.e. the so-called epidemic growth factor, a growth factor which regulates cellular replication, also increased; not only in the tissues, but in the blood as well. Therefore, they can be seen as interesting markers for late exposure. There is room for studies of this kind among these pathologies.

Let me end with a few comments. Are we studying the molecular epistemology of asbestos and vinyl chloride exposure merely because it provides a good model? Only because it is an academic exercise on an interesting model? No doubt, it is an interesting model, but it isn't only a model. Vinyl chloride was used as a propellant for hair sprays throughout the '50s and '60s. Already in the 1960s, newspapers were spreading the news that vinyl chlorine levels in certain hair saloons were as high as those in chemical plants. What this

10.15 am - Marina Saetta: The inflammation of air passages caused by cigarette smoke.[32]

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means, is that today, 30 years after the industry found out that vinyl chloride causes cancer, and that it caused the death of many, many people, including a number of people who didn't know they had been exposed to it, some people are still running a risk. Given the situation, it is interesting to have markers which allow us to study this potential social risk, which is still not well-known. What about asbestos? Is asbestos a mere academic exercise? I dare say not, since asbestos is considered an epidemic today. Millions of people have been exposed, for professional reasons, to asbestos in the XX century. Mesothelioma latency can reach 50 years, so we should expect about half a million deaths caused by asbestos exposure in Western European countries, in a sort of epidemic which might last until 2035. I also ought to point out that asbestos exposure is still a problem in developing countries, since it still being used, I believe. So, if asbestos-induced cancer deaths are not a mere academic exercise, but a real problem, it is important to possess the means to monitor the phenomena and people affected.

So, why are we using molecular epidemiology? Let's leave DNA and protein adducted covalents aside, not because they are not interesting – they are essential –, but because they concern current exposure monitoring, while the monitoring of people who were exposed should be based on individual susceptibility biomarkers which are measured in the blood and lymphocytes, and on precocious carcinogenic biomarkers. These biomarkers not only constitute a model which can be applied to other environmentally toxic phenomena, other partially carcinogenic substances, but also a model which can constitute a means for the identification of the risk run by people exposed to carcinogenic chemicals, including monomerous vinyl chloride and asbestos, in the past, in such a way as to identify the people which run the biggest risks, and which might undergo a specific screening program, a stricter one than the expensive and probably less precise ones we are carrying out today. Thank you for your attention.'

[32] *'I would like to thank the organizers for their invitation. It would seem like there has been a significant decrease in the level of lung inflammation, particularly in the case of young people, who are attracted by this kind of publicity. Smoking is the cause of significant lung inflammation. This is the periphery area of a person who doesn't smoke. You can see it is thin wall; this is the periphery area of someone who smokes: you can notice bronchial constriction and a significant inflammatory process on the lung's walls. Basically, all people who smoke have inflamed lungs. In a population with many people who smoke, about 20% develop COPD, an illness which can become very serious. I will now briefly describe the pathology of this illness.*

COPD is characterized by a limitation in the flux of air. Given this flux is caused by pressure and by the resistance which contrasts it, a reduction of the level of pressure can diminish the pressure or increase the resistance. The pressure is chiefly caused by an elastic recoil of the lung and a destruction of the parenchyma, which is characteristic of emphysemas. The resistance is especially due to an obstruction of the air passages, and one of its pathological foundations is an inflammation of the air passages. There are other two main components which can contribute to the development of this chronic limitation: parenchyma and the airway, which are connected one with the other.

I have mentioned the fact that people who smoke and suffer from COPD suffer from an inflammation of periphery air passages, which is connected to the destruction of the parenchyma. In the case of the area of a person who does not smoke, alveolar junctions surround these air passages. This, instead, is the periphery area of someone who smokes and suffers from COPD: the junctions are utterly lost. The number of these junctions in periphery areas diminishes proportionately to the increase in the level of inflammation: the greater the inflammation, the greater their destruction. Here is an hypothesis: we have the destruction of the nuclear junctions among smokers; here is a section of a periphery airway; here is a lumen, here is a wall and here is an alveolar junction which is still intact, whereas the other has been completely destroyed. Through inflammatory cells it is possible to facilitate the point of junction with the airway wall, while mechanical stress is perhaps at its peak. One should also observe how this destruction is not limited to the airway, but can be also found in lung parenchyma; people who smoke can reach similar levels of destruction of the parenchyma in two different ways: some are affected by centre-lobular emphysema, other by panlobular emphysema.

If this is a normal parenchyma, with normal air passages, this is a smoker's parenchyma, with a centre-lobular emphysema. You can notice a centre-lobular emphysema characterised by destruction, and by the enlargement of the first areas, surrounded by other areas with normal lung parenchyma. This is a smoker's parenchyma with COPD: you can notice a panlobular emphysema, which is also characterised by homogeneous destruction.

Given the central role of the inflammatory process, we should now focus on the various parts of this inflammatory process, and try and emphasize the fact that each of these components can contribute to the limitation of the flux of air. So, we have inflammatory cells, mucus-secreting cells, and the smooth muscular mass. If we count the number of inflammatory cells in smokers not suffering from COPS and of smokers suffering from COPS, we can see how the only difference lies in an increase of COPD among smokers, whereas the other inflammatory status is similar in the case of both groups.

I would now also like to stress the fact that this can be found not only in periphery areas, but also in central areas, in the parenchyma and even in the arteries of the lungs. Here we can see COPD in the periphery area, here in the central area and in on the alveolar walls; here, in the arteries of the lung. I would now like to stress the fact that cells not only increased the number of all these components, but have also been linked to the degree of limitation of the flux of air. Here you can observe the number of CD8 in relation to FEV1: a

10.30 am - Paolo Vecchia: Electromagnetic fields: an actual environment polluter?[33]

negative correlation exists, whereby the higher the number of inflammatory cells, the lesser the ability of the lung to function. We now considered whether this immunisation CD8 response was limited to the lungs, or was also present outside the texture of the lungs, and particularly in the lymph nodes, and observed an increase in the number of CD8 of the lymphocytes of the para-tracheal area, when compared to the case of smokers not suffering from COPD. These are para-tracheal lympho nodes affected by COPD. This is COPD and the lymphocytes are in red.

From a traditional point of view, a solution was found. A viral infection is also present among patients suffering from COPD, and it may be that an excessive functioning of T lymphocytes might come about, as a consequence of various viral infections, and that it might even damage smokers' lungs. On the other hand, it might also be the case that T lymphocytes CD8 damage the lungs even without any viral infection.

To sum up, here we can see how smokers who develop COPD suffer from an inflammatory process which is characterised by an increase in the number of lymphocytes T CD8, not only in the lungs, but also in the lymph nodes. In the case of mucus-secreting cells, when we measure the number of cells in periphery areas of smokers and non-smokers, we can notice an increase of goblet cells; this is the periphery area where we can notice a high level of goblet cells, even in the epithelium, which can better be observed here. This is the epithelium: you can see the goblet cells in red. It might also be the case that hyper-plasia causes the obstruction of air passages by producing excessive mucus, which might alter superficial pressure. The role of mucus hyper-secretion in the development of a chronic limitation of the air passages is still a matter of debate. For many years, it was considered irrelevant for the development of this illness; recently, it would seem like a direct link exists between chronic hyper-secretion and the FEV decline in morbidity. Therefore, it would seem like mucus hyper-secretion might be a cause.

The smooth muscular mass of the walls, which we measure in both smokers suffering from COPD and smokers not suffering from COPD. In COPD suffering smokers we find this layer. Here, instead, you can see someone who doesn't smoke: the layer is thinner and we cannot even identify the smooth muscle; in the case of the person who smokes, the wall is thicker and we can observe an increase in the muscle mass.

Here are two elements which can lead to the development of the illness characteristic of smokers: parenchyma and the airway. Parenchyma is characterised by the obstruction of alveolar walls around the air passages, which can also reduce pressure; air passages are characterised by an infiltration of inflammatory cells. We also find an increase in mucus-secreting cells and in the thickness of the muscular mass. All studies we have seen so far described the pathology of patients suffering from a slight or moderate COPD; however, we now know that COPD can worsen significantly: this graph shows how the functioning of the lung is impaired both in smokers and in non-smokes. This is the death line, this is the illness line. As you can see, the decline in people who don't smoke is only slight, and never reaches the illness level. Here you can see how the functioning of the lung decreases quickly, and reaches the death line, unless one stops smoking. The function therefore decreases more slowly, almost at the same rate as in the case of people who don't smoke. This is John Houston, who, before dying of COPD, encouraged people to fight lung illnesses, and pointed out that taking care of one's lungs is a matter of life or death. Once COPD, which is a progressive disease, has developed, it can lead to a terrible deterioration in the functioning of the lung; drastic operations are then necessary: people have to be hospitalised, mechanical ventilation, lung transplant and even plastic surgery are required. The life expectancy among these patients can be very low.

As a study made revealed, the mortality rate of those suffering from COPD is of 49% in two years. This is truly dramatic. Here you can see a smoker with severe COPD, with the increase of inflammatory cells in red, which are not present in the case of this other person. Here you can see the lumen, the epithelium, and how the walls have been infiltrated by inflammatory cells which are very important from the progression of the illness.

To sum up, we have seen how smoking can lead to a process of inflammation of the lungs, and how smokers can develop COPD, an illness which can lead to death. I would like to end my paper by stressing the fact that despite all the attempts made with drugs, the only thing that can help stop the progression of the disease is to quit smoking. Thank you.'

[33] *'I would also like to thank the organisers for having invited me to this most stimulating event. I am sorry for the misunderstanding I had with the organization, in not preparing any Power Point colour slides: I'll just have to talk, and try to capture your attention in some way, particularly because I wouldn't like to focus on the effects of electromagnetic fields on human health. I believe this is not the appropriate place to do so. Instead, I would like to discuss certain issues of method connected to the very idea of electromagnetic pollution, which, as the president himself explains, gave way to quite a few misunderstandings. The fact that technological progress lead, particularly with the development of new technologies and cell phones, to an increase in electromagnetic waves is obvious. The number of sources of these waves have been hugely increased, leading us to talk about electromagnetic pollution, or "electrosmog"; this ideas has certainly been suggested by certain considerations, by the ubiquitous presence of electromagnetic fields, which are pervasively present in every living and working environment today where an object which works through electricity or electronic systems is to be found. This is an artificial agent, somehow associated to the idea of pollution. It is no doubt an agent which interacts with biologi-*

cal systems and the human body, so it does have certain effects on health. And yet, the term 'pollution' rather questionable for a number of reasons: firstly, because it suggests the widespread presence of indistinct agents from various sources. The use of such a general terms leads us to consider high-voltage electric lines, electrical appliances, radio and TV equipment, mobile phone stations and so on in the same way, as if we were merely dealing with the undifferentiated sum of a series of electromagnetic waves, which indistinctively contribute to environmental degradation. This is all far removed from actual reality: the various electromagnetic fields caused by the various sources are of an extremely different physical nature, and thus react to biological systems and human bodies in very different ways. This is clearly shown by scientific research, but it is also a matter of common sense. Just consider the fields created by high-voltage lines on the one hand, and mobile phone stations on the other, just to mention a few controversial examples known to citizens.

High-voltage lines produce magnetic fields with a specific frequency: as many of you might know, they oscillate with a frequency of 50 hertz, i.e. they change their direction 50 times a second. Mobile phones use 900 to 1800 mega hertz frequencies, i.e. from 900 to 1800 million oscillations a second. Common sense suggests that any reaction we might have in the case of 50 oscillations a second cannot be the same as the one we can get with 1800 oscillations a second. Actually, scientific research confirms this hypothesis: the biological effects which have been documented in the two cases are completely different, and we ought to distinguish the various sources on the basis of their different physical characteristics, which include, but are not limited to, their frequency.

Another reason which makes the term "pollution" somewhat problematic is the deep difference between the so-called perceived risk, i.e. the feeling one has of running a risk, and the actual risk measured by scientific research. Pollution is associated by the presence of a substance which is actually toxic for many or other species in the environment. In the case of electromagnetic fields, it is believed – the expression 'urban legend' was often used to describe this belief – that science reached this conclusion. Actually, the case is a rather different one, reality is rather different, and the situation varies according to the kind of electromagnetic field.

Again, I will stick to the two examples just mentioned. In the case of low-frequency fields and high-voltage lines, the International Cancer Research Agency, following a study on the whole scientific literature which was carried out in 2001, classified these fields, group 2B for those who are acquainted with the classification method used by the Agency, as possible carcinogenic for man. This classification is subject to change. As the World Health Organisation observed, it is the carcinogenic effect of the lowest of the three categories which cannot be ignored; the other two categories are represented by the no doubt carcinogenic benzene, which was previously mentioned, and by radon, which will subsequently be discussed. It is worth noticing how in the first category we even find solar radiations. The other agent is class 2A of the so-called likely carcinogenic substances. What we are dealing with here, then, is a classification scheme in which, to quote the Agency again, the role electromagnetic fields are credited with is a likely, although the possibility the explanation of the phenomena which might have been observed, and which epidemiological studies suggested, might instead be due to other factors or mere casual fluctuations. This assessment certainly makes for caution and a number of reflections, although it is far from revealing a sure carcinogenic effect.

As for high-frequency fields, disagreement on the perceived risk is even greater. Let me quote, unfortunately only from memory, a World Health Organisation document, which can accessed, as almost all I am saying, on the World Health Organisation website. The document provides a general assessment, as it more or less claims, of the vast and complete scientific literature on high-voltage fields, on telecommunications, mobile phones, radios, TVs, etc., which does not seem to offer any clear evidence of the power of electromagnetic field exposure to shorten human life, to induce or favour cancer. These are the words used by the World Health Organisation. It is a 1998 assessment, subsequently confirmed by epidemiological studies made between 2000 and 2001, particularly on the impact of mobile phones. Large scale studies have not shown any increase in brain cancers or other kinds of cancer among cell-phone users, compared to the rest of the population.

The harmfulness of electromagnetic fields, therefore, is still a matter of scientific debate. No doubt, the situation is very different from the one the general public has in mind. I would like to stress a further point, which seems to point at the inappropriateness of using the term 'pollution' in this context: the pollution we commonly refer to, due to chemical or other substances, is usually caused by the release of a noxious agent in a given moment and situation. Yesterday, for instance, we mentioned examples of the spillage of oil and other pollutants in the sea: another obvious example is that of the any kind of industrial discharge, which releases gases or liquids which remain in the environment and pass from one species to another, depositing and spreading with the winds and currents. They gather in the soil, and pass from the soil to plants, and from these to animal species and man. They spread to ground water and then again to man. Therefore, they bring about specific mechanism which damage the environment in a number of complex ways. This is certainly not the case with electromagnetic fields. Magnetic field sources release the fields in specific direction, in a stable and permanent way, which can generally be foreseen with mathematical models, which make many monitoring attempts superfluous and questionable from several points of view. No wind, current or external agent can codify them. Last but not least, the moment exposition ceases, so-called environment pollution also ceases. These are completely different characteristics, and the distribution around sources is, as we all know, even from memories of school, closely linked to distance: electromagnetic fields are generally concentrated in the immediate vicinity of their source. The effects of a high-voltage line are markedly to be felt within dozens of meters, not beyond that distance. The same goes for radio and TV stations, where the well-known decay following the square of the distance takes place, whereby the effects are significantly reduced at a distance of dozens or hundreds of meters at the maximum.

10.45 am - Klaus-Rudiger Trott: Nuclear radiation from sun and earth.[34]

Not least, almost all sources have a strong directionality, particularly in the case of cell phone aerials, which emit a 7 degrees vertical beam, an extremely narrow beam, which only significantly expose those who might find themselves within the main beam, something which rarely happens. Let me add, although it might sound obvious, that the sources of electromagnetic fields, aerials and long-distance power lines cannot cause any accidents. Many of the examples of pollution we mentioned are of an accidental nature.

It might sound like a trivial matter, but I often show students or people newspaper headlines; I remember one, from one of the main Italian newspaper, which I always show: it describes a radio and TV aerial in terms of an electromagnetic Chernobyl installed in an Italian region, misleading the unaware citizen and spreading the kind of distorted ideas I previously mentioned. Another issue which might sound like a trivial matter, but which I believe to be important, absolutely crucial, is the fact that the idea of pollution suggests the presence of an unwelcome, noxious agent in the environment. This is the case with car exhaust fumes and with any kind of industrial waste, which is a by-product, an unwanted product of technology. We would all be glad if cars could travel without exhaust fumes; conceptually, this might even be possible: the renowned hydrogen car should function without any fumes whatsoever. In the case of electromagnetic fields, and radio and TV stations in particular – this is not the case with high-voltage electric lines –, we should always bear in mind that they are the product themselves, not a by-product of technology. Therefore, it is rather contradictory for citizens to claim the right to use mobile phones, to always be traceable, access radio and TV information anywhere, and at the same time be opposed to electromagnetic fields.

Does this mean we should then passively accept the presence of these fields, and that the higher the level of electromagnetic fields the better, for we get to have a better service and a better chance to receive signals wherever we might be? Absolutely no – I would like you to misunderstand my words: this is not the message I would like to convey. We have already pointed it out other times: our aim is a sustainable and optimal technological development; our aim should be that of keeping electromagnetic fields to a minimum but optimum level, in such a way as to guarantee a high-quality service, which is also compatible with a series of prerequisites. Well, our aim then is that of finding the best possible solution, a solution which – we should bear this in mind – can at times be far removed from what an intuitive approach might at first suggest.

For technological reasons which are rather easy to understand, and which I do not wish to dwell on too long, the level of exposure in the case of cell phones can be lowered by multiplying the number of aerials, although this might at first appear paradoxical: the greater the number of aerials, the closer they are to the user, the lower the exposition, both that due to aerials in general, since each of these releases a lower level, both – and this is more important in terms of individual exposure – because the power of cell phones, which behave like humans in talking more or less aloud, depends on the receiver is working well or not. If the receiver is working well, the cell phone might lower its power, even of 1000 times, thus reducing exposure up to 1000 times. We ought to bear this in mind in the case of some kind of effect is observed, although the level of exposure caused by talking on a cell phone is on average a hundred, a thousand times higher than the level we might be exposed to, even in the most unfortunate circumstances, by living near a radio base station. If our aim is that of reducing the level of exposure, a merely sanitary goal to reach through prevention, we should, paradoxically, increase the number of aerials. This clearly collides with the aesthetic susceptibility of citizens, which would not accept this.

I ought to say, that I am glad to find out, for the first time after attending so many conferences of this kind, that environmental issues are also discussed in terms of the protection of the historical heritage and landscape. I ought to point out that, despite the fact that all the things I have said might have sounded as a defence of technological plants, I felt bad in noticing a huge mobile phone receiver by the Strada Nuova in Venice: it completely, obscenely spoils the city. So I can certainly understand the problem posed by the presence of these plants in historical cities, living spaces and the natural landscape, and the need cautiously to minimize the amount of exposure. The best solution ought to be compatible with reasonable, affordable expenses for society. I would like to end my paper, then, by stressing the distinctiveness of electromagnetic fields, of so-called electromagnetic pollution, and by conveying a message which perhaps is not confined to electromagnetic fields, but should be clear, in many ways paradigmatic, and which might lead to further discussions. Not all pollutants are the same: it is necessary to bear the distinctiveness of each agent; as for solutions, I believe they ought to be found, both in the case of electromagnetic fields and in other cases, not through rather broad, indiscriminate campaigns, and an often misunderstood fight against pollution, but through an intelligent, balanced, patient kind of research, an attempt to reach agreements, through correct information and ongoing debates, which this particular event, which I would again like to thank you for, might be an important part of. Thank you.'

[34] *When awareness of the health risks from environmental pollution first began it was concerned mostly with the acute toxicity of the exhausts from the steam engines and from chemical processes which were visible and smellable and for which there was direct evidence linking the smog or the chemical plumes to acute or chronic health problems such as respiratory distress or skin rushes. Today, this sort of enviromental pollution which causes directly attributable damage to health has become rare in industrialized countries although they are still common in developing countries where economic and industrial progress has precedence over environmental concerns.*

As we learnt from these past disasters how to prevent them or at least make them very improbable, rare accidents, the emphasis of environmental protection has changed to potential health effets of more insiduous pollution with agents and at concentrations for which

11.00 am - Kathy Smith The E.U. directive on heavily polluted areas - The case of Ostina Blada [northern Bohemia – Cech Republic][35]

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we do not have any sensory abilities but which we can measure with intricate physical or chemical methods. They may cause long-term health damage, in particular cancer. Yet, the link between exposure to the pollutant and the occurrence of the helath damage is not as obvious as in the past. Moreover, the lack of direct experience of exposure and its relation to health risks often leads to uncertainty, worry and, in many cases, panic which is particularly obvious in the special case of nuclear, ionizing radiations which most people see as a secretive threat to their well-being.

The most comprehensive epidemiological study into the long term healath risks from environmental pollution is the study on the survivors of the atom bombs of Hiroshima and Nagasaki which has been following closely a cohort of 120.000 people now for more than 50 years and is still going on, even looking at tens of thousand children of the exposed people. It is not only the principles and regulations of radiation protection that are based on this study, it also set the gold standard for any other study into the long terms health effects from any enviromental pollution.

I want to address a few issues which arose from these studies and may apply to the cancer risk from many or any other type of pollution be it physical such as UV light or electromagnetic waves (e.g. those associated with power lines or mobile phones) or chemical or bacterial.

1. Clinical presentation, time of manifestation, even mutation patterns or other molecular changes of radiation-induced cancers, as far as we know now, are not different from those of spontaneous cancers

2. The latency between exposure and manifestation of induced cancers may vary between few years and more than 50 (!) years. The latency depends on the age at exposure and the type of cancer. Latency is shorter for people exposed at older age than for young people, e.g. for lung cancer. This means that negative results of epidemiological studies after exposure of populations to a potentially carcinogenic agent with a follow-up of less than 20 years are pretty meaningless.

3. The type of cancer induced by exposure of a carcinogenic agent varies between agents. Some types of cancer which are common in a normal population such as lung, colon or breast are very susceptible to induction by radiation whereas others which are equally common such as cancers of the rectum , the prostate or the cervix are very resistant to the induction by radiation. Moreover, the type of cancer induced by irradiation varies dramatically with the age at exposure: the most common cancer after exposure of very young children is thyroid cancer (while the thyroid of adults is very radioresistant), the most common type of cancer of young female adults is breast cancer (yet the breast of older adults is not susceptible to development of radiation-induced cancers). In old adults, on the other hand, lung cancer is most common after radiation exposure. This demonstrates clearly that biological factors are as or more important than the pattern of exposure to the carcinogenic agent.

4. Some people are more susceptible to the cancer risks from radiation exposure, either due to genetic predisposition or to life style factors. The molecular mechanisms behind the genetic susceptibility to radiation-induced cancer are one of the top priorities of radiobiological research. But they also pose a very difficult ethical dilemma: Should we design protection strategies for the most vulnerable member of society, or for the average member of society? Should we exclude susceptible people from professions and occupations where exposure might occur?

5. Epidemiological evidence for induction of cancer by radiation is available only after levels of exposure which are far in excess of those we may encounter in the environment. Even after the dramatic accident in the Chernobyl nuclear power station, the only epidemiologically documented long term health effects from radioactive pollution was the dramatic epidemic of thyroid cancer in those children who were exposed under the age of five – but there was no evidence for leukaemia or other types of cancer. Any attempt to quantify the carcinogenic risk of radiation levels present in our normal environment directly by epidemiological research it futile and doomed to yield ambiguous results without any practical or scientific value – although there is one notable exception: those people who live in houses where the concentration of the naturally radioactive noble gas radon exceeds 200 Bq/m_ have a significantly elevated risk of developing lung cancer which, however, is small compared to the risk posed by smoking. In all other situations, environmental radiation levels from the earth, or the sun, or man-made, are one or two orders of magnitude lower than those which were associated with a significant carcinogenic effect in large epidemiological studies on tens or hundreds of thousands of study participants. Incresaing the size of the study population even further to include millions of people cannot resolve the fundamental problem that the carcinogenic effects of low doses or radiation, and low exposures of other carcinogens cannot be investigated directly. This means that any statement on the health risk of low doses of carcinogens is based on extrapolation from the evidence-based risk at higher doses by using a mathematical equation. Extrapolation assuming proportionality between dose and risk, the so-called no threshold linear dose response model is very popular in all areas of environmental studies. It was first proposed by the International Commission of Radiation Protection as an appropriately cautious method to optimize planning of radiation protections measures. This is what it is, no less, no more. It is not based on scientific evidence.

6. Minimizing risk is an important taks requiring comprehensive consideration of all alternatives. or general environmental protection

[35] Kathy Smith stated:

'I was asked to talk about the EU directive. Some areas are extremely polluted. We went ot Ostina Blada, in northern Bohemia, in the

Discussion among those taking part in the work group and conclusions.

12.00 am – Open discussion with the participation of:

Severino Benettelli: VAS ('Verde, Ambiente, Società') journalist

Giancarlo Riuscitti: Enterprise Manager

Kathy Smith: European Journal Reporter

Czech Republic: this is a beautiful area, with pretty houses and hotels, but it has turned into one of the most heavily polluted areas of Europe. The reason is that there are extremely important lignite reserves, and that plants were built which provided electricity to cover three quarters of the Czech Republic. We then find chemical industries, and people using coal to heat their homes: the end result is the kind of smoke, of smog, London suffered from in the 1950s.

We met a lady who had suffered from breathing problems because of this pollution. She said she couldn't even see the house in front of hers when the situation was most critical. She suffered from breathing problems at night, she couldn't breathe properly or walk home. The directive considered the pollution level acceptable, although doctors told us that many of their patients were suffering from asthma. It was also a social problem, since children couldn't play outside, but had to stay at home, which caused a series of other problems of course. And it wasn't only a matter of human health: forests suffered as well, and pollution spread to Poland, since it doesn't respect frontiers, and many forests died. This went on for several years.

Ten years ago, when the Communist regime had fallen and the governments paid more attention to the environment, and took more responsibility upon themselves, they began to deal with the problem. Given the northern part of the Czech Republic boarders with Poland and Germany, the Ministers of the Environment signed a declaration and committed themselves of abolishing this area, this black triangle, as it was called. And they did. Like a guard dog, the European Commission checked the situation with a joint monitoring carried out by these three countries, since it was necessary to know what was going on. In this town we were in, Ostina Blada, the buses themselves carried flags when pollution with particularly strong, as a sign for people not to practice physical exercises, but stay at home. The result of our monitoring activity was made public, in such a way as for people to realize how grievous the situation actually was.

The governments of the three countries began investing with the World Bank in plants for the purification of the air, closed some mines and chemical plants, and even changed the central heating, by switching from carbon to methane. The European Commission provided some funding for alternative fuel. We also visited another city, a thermal area, with a great potentiality for the use of hot thermal water, and visited a kindergarten to check whether there was any hot water available for the children. We wanted to provide all the city with hot water from the thermal sources. Ten years after this declaration, the SO_2 level was reduced by 80%. All pollutants were within the acceptable levels set by the European Community. Smog vanished. The lady I had talked to told me that she saw flowers and birds in her garden, which she had never seen before, and that children no longer suffered from breathing problems. Other children, however, suffered more from the kind of allergies we have. One problem disappeared, therefore, and a new one took its place.

A reforestation program was implemented: we now have trees again, and should no longer call the area a black triangle, but a green one, although new problems related to traffic have emerged, given the fact that a lot of people work in Germany and only return to the Czech Republic in the evening. This is no doubt an appealing program, an extremely appealing film. It is also interesting to observe the impact of the environment on human health. Later investments were made and the situation improved.'

3rd WORKSHOP: 'THE INTERDISCIPLINARY PROTECTION OF THE URBAN ECOSYSTEM.'

WORKSHOP MODERATOR: GIUSEPPE ZUPO[36]

Participants: Giuseppe Berlato Sella [Mayor of Schio];[37] Simona Isidori [Agenda XXI – Municipality

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[36] Among the many sharp and – as always – stimulating points raised by Zupo, we would like to mention a specific one dealing with an environmental case tenaciously fought and won by Zupo in the courtrooms: the case of Monte di Male, where the municipality met to oppose the quarrymen, which had caused serious environmental damages:
'I have mentioned environmental sustainability, the ambivalence and ambiguity of the term, and its environmental sustainability and essentiality , not least in relation to urban compatibility and the ambivalence of local, specific contributions. I mentioned the case of red squirrels, of a situation in which a manipulated local environment attempted to stop one the big astronomic centres, etc.. As a Southerner, however – I hail from Calabria – I also met wonderful mayors in your region. Unfortunately, I haven't yet known the mayor of Schio well – I just met him, and hope to get to know him better. I did meet other mayors, the mayors of Valstagna and Monte di Malo, who are both present here, among them. A distinguishing feature of these mayors, although I haven't seen them in about a year, is the fact that they have a job beside that of mayor in their town, which they deeply love. They work as mayors because they are profoundly committed to their duty.
We have fought together with the mayors of these small towns – Valstagna is slightly bigger, but Monte di Malo is really very small, it is the place where the wood to build Venetian ships used to come from. There I have seen houses which still show trunk stripes from the trunks which used to hurled down the mountain. We fought two magnificent battles against the arrogant iron mine bosses.'
[37] Sella spoke as the mayor of the municipality of Schio, which he defined as a 'small municipality, of 338.000 people, set at the piedmont:
'We have a hinterland of 60.000 inhabitants, although the number increased with our spread to Recoaro and Breganze, municipalities of 180.000 inhabitants. We are carrying out realistic, specific projects to inform public opinion. Our most recent activities can be found in that booklet.
We reviewed the Regulation Plan, with Prof. Doccetta as an external consultant. With the explicit advice given by Prof. Campirol, we then took Strategic Environmental Assessment into consideration; we are the third municipality to adopt it: as you all know, a European resolution should make it mandatory in a few years, but we have already adopted it. The regional administration has being examining our Regulation Plan for 3 or 4 months. I know that those carrying out the preliminary investigation were rather enthusiastic about it. It passed the preliminary investigation, and was then handled by the Technical Commission, which approved it, and postponed it to the 15 February, so that it is the Region and not the Province which is going to finally approve it. I believe it is going to be passed to the Second Commission in about 10 days. When it will get back home, we'll not only have this Regulation Plan, which focuses on the increase and improvement of settlements, of access to the town, of schools, which ought to be organised on a campus basis – we already developed the campus network, in such as way as to make schools meet one another and improve; we also have this specific means of monitoring and certain parameters we have already established, following which we should see how the evolution of the implementation of these 900.000 cubic meters, the potentiality of the new Regulation Plan. The implementation should take place without further aggression towards the environment, or even by correcting past aggressions. If you are familiar with the issue, you can read this page, which explains what I mentioned a bit better.
The third page – the second I will later discuss – talks about EMAS. We live in an industrial area of 4 million square meters, where 400 sheds were set up in the past 25 years, with about 500 activities, although we now also have the tertiary sector. We would like to obtain a certification for the land. We are collaborating with artisans; this page explains what ought to be done: we chose EMAS, and ought to outline an environmental policy, elaborate an initial environmental assessment, outline an environmental program with actual actions and implement a program of environmental administration. We should then periodically audit the administration method both internally and externally, in order to obtain an actual certification. This allows us to be registered as a municipality; on the second page, we find our hypothetical idea of a revolving credit with the artisans' association, which would provide assistance to those who would like to improve their activities to reduce the likeliness of pollution with more sustainable systems. This would provide incentives for the implementation of interventions of this kind, which are usually expensive, and which we would provide financial aid for.
The issue connected to formation is the involvement of technical high schools, by getting the students to know the professional world. A third project we have established in the past few years is the fifth Productive Installment Plan. We have organised 4 or 5 of these, and will organise another two, one of which we would like to turn into a bio-ecological village, through a few expedients, and thanks to ATER, which we have assigned an area to, and which should respect a few points we have agreed on.
On the two pages I gave you, you can find certain prerequisites; we have been working on the ideas of bio-architecture and bio-ecology for one year and a half, with the possibility of recycling water, using waterways and water expanses, which improve the micro-climate, reducing our use of water resources, optimising the exchange of energy, and increasing the physical and psychological well-being

of Sesto San Giovanni (Milan)];[38] Zecchinato Marco [Urbanist – environmental planning expert];[39]

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of the inhabitants. Not least, because by orientating building in a certain way it is possible to reduce traffic, and deviating it to the outside. This is a new area we have already found, and which has been approved: work should start within a year.
The fourth thing I have included is the information chart about the parcelling out of Central Park. If you are familiar with the subject, you should know that in England there is a patent for a so-called intelligent, zero energy village. Two years ago I visited such a village in London: it had almost been completed, after years of work involving hundreds of people and the use of physics technology. I went to visit the village; and architect from our area bought a piece of land (the exact number of square meters can be found on the second file). The village recycles material, and has this huge tank for gathering rain water. There is no individual heating, only glass panels with mechanisms which produce energy. In front of each house there's a small parking lot with electric cars, and they used salvaged material. At the end of this row of houses there's a building with a single boiler which uses biomass as fuel. In the place where people wash their plates there's a visible counter which measures the amount of water each person consumes.
Other systems exist, a series of small changes which together produce amazing results. For instance, were an apartment not to be inhabited for 6 months, there is something inside to produce heat, to avoid it to be unbalanced... I am being provocative here, I would only like to make you curious. We also find huge rotating chimneys for the suction and expulsion of air. Very interesting things.
According to the gentlemen who opened this studio at Milan... unfortunately, I studied French and am always slightly embarrassed at quoting things in English, I'm not too sure what this patent is called, but you no doubt know what it is called. We'll shortly be approving this project, and have already asked the EU for funding. A first assessment is already underway at Vienna. A second assessment will follow, and we are present as a municipality, in such a way as to show how a few urbanization projects they will implementing can be of public interest. Were they then to lower the parcelling out cost, they would realize something of great use for the general public. According to these Englishmen, this village we are about to start working on will be extremely important – again, we will take care of orientation, etc. –, since all the artisans of Schio (plumbers and carpenters) will have the chance to learn the expedients and tricks which will be employed in the village; they expect the applications for the implementation of the project to become gradually cheaper, as they have already witnessed in England. They expect the neighbouring houses to gradually follow this example, by installing electric, heating plants and so on, with the same techniques used in the village.'

[38] This is what the Mayor said:
'I deal with Agenda 21. The municipality of Sesto San Giovanni, north of Milan, a highly urbanised area, hardly inhabitable, is now trying to save what can be saved. We have huge areas which are undergoing changes, despite all the problems arising between the municipality and the individual properties, and are trying to develop projects of sustainability.
My everyday work for Agenda 21 is that of organising a common project from sustainable development with the citizens taking part in the forum. This is a tough job. Given the fact that we are dealing with a rather limited areas, I would like to stress the fact that reaching actual results is not an easy task, nor is introducing sustainability markers easy. For about one year, I've met managers and associations to outline local markers. This is a difficult task, even when enlightened people are found in a local municipality and administration. Italy is rather behind, for projects of this kind are still seen as elite phenomena, for environmentalists: a lot of work still has to be done to merely discuss the idea. We have about a million and a half square meters to be transformed, and the mere discussion of ecological villages and different standards is an arduous task, even in more developed areas, because the services, social services, for instance, might be excellent, but issues of this kind still have to be dealt with. Anyhow, it is a stimulating work. I am here to accept Folin's invitation.'

[39] This is what Mr. Zecchinato had to say:
'I am an environmental planner, and mostly deal with urban planning. The previous papers seem to have stressed the importance of both local and global aspects. I recall what Magnaghi had to say about self, local sustainability, which is certainly a matter of local and global relations. I am a member of the National Urban and Environmental Planners. While we once used to take a more global approach, in the past two years we have been attending the European Council of Town Planners, and have developed an outline which included a sustainable project on various levels.
In our checklist we have identified a series of procedures the plan should follow in order to be sustainable, starting from the participation phase, to the more specific points about water, air, noise and waste. The single components affecting the general planning process have been stressed. The project is a rather complex one, but we have attempted to develop through guiding lines. Besides this project, we have recently revised a publication, the Chart of Athens, which was outlined by the European Council of Town Planners, and which we revised. Besides dealing with deontological norms for town planners, it also contains a series of principles which I believe our projects should adhere to.
Along with this theoretical approach, we find a discussion of the various projects, on the fact that some people claim that a generation of projects has died, and that a new one is being born. I believe this to be linked to the current of thought focused on complex programs, new programs which we are developing and which affect urban structures.
From this point of view, several important points were raised in the course of our debates. A first point concerns a tendency which can found, at least in the Veneto, in recent years. It consists in the idea that this first version of the projects is fading out, and that these

Gianluigi Ceruti [Lawyer – Lecturer on nature conservation at the University of Camerino];[40] Benito Sasso [Mayor of the Municipality of Valstagna (Vicenza)], who discussed some of the issues related to the vulnerability of mountainous areas,[41] stressed the merit of the conference the Academy

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programs, this planning of programs and approaches is taking its place. More specifically, we find a tendency towards an integrated approach, on a larger scale; on a smaller scale, we find an even more detailed study, which basically is the kind of urban planning the municipal administration would carry out.

I have just seen the draft of the regional law which was recently drafted and is currently being revised and postponed. We previously referred to this law. The certification of projects is rather interesting, which would allow us to discuss about these 9 plans, or at least about the older plans... With the new planning projects which will be developed if a board can be found of a similar kind of the one for certifications – EMAS or ISO for environmental certifications –, a board which might certify the plan. I now have in mind these guiding lines we established with the European Council of Town Planners; were it possible to discuss the normative and legislative criteria the plans should follow... this would be something.'

[40] *'Ours is a great constitution, which is universally recognised. I recall that when I was a member of parliament, I took part of a delegation in Czechoslovakia. Dubec and Habel greeted us, and we also had an important meeting with the Ministry of Foreign Affairs Haiec, and we also met with the High Court Public Prosecutor, the equivalent of the Public Prosecutor of our Supreme Court. Habel also had a great juridical knowledge, and Haiec was a lecturer at the University of Prague. They all told us: 'you have a wonderful constitution, which the whole world admires, so try and maintain it'. Well, we have already impaired it quite a bit. Were we then also to touch Art. 9 and 117, which establish the protection of ecosystems as one of the duties of States, I believe we would be taking a very wrong turn. As a citizens, free from any political affiliation or party membership, I really hope for a change within the next six month, because we are truly taking a grievous turn.*

As everybody is saying, our country is gradually deteriorating, both in its economy and customs, and we all ought to try and stop this, regardless of our political affiliation. Unfortunately, even when compared to previous parliaments, the quality of our political leaders is extremely low. Previous parliaments might have been made up of crooks, but the cultural level was far higher. It is truly depressing to listen to certain debates in the parliament today, not to mention in local councils, starting from that of the Veneto.'

[41] Mayor Sasso stated:

'I think I am rather unprepared to entertain my illustrious colleagues. As you mentioned, there might be a feeling, a belief, a desire to act, but it is not supported by the necessary preparation to support an often strong will. So, when we talk about the protection of ecosystems, we always discuss the issue of compatibility for the interest of society.

I am sure that in an area like ours, our like that of Vicenza, which you mentioned, historical events themselves revealed the vulnerability of the land. I would then like to point out how it is the recent memory, and the ancient memory of our fathers, which provide us with essential means to fix the situation. Of course, this ought to be accompanied by the scientific collection of data and by the analysis required to establish models and reach more sustainable predictions in terms of qualifications and emergencies.

I have also recently attended a conference at Longarone, on the 8th of October, which revealed the inevitability of the accident. Dr. Ceruti listed all the binds of humanity, from America to Italy: we place these binds only to infringe upon them. Here we are developing a territorial coordination, marking protected areas, and then establishing quarries and especially mines, which are easier to establish thanks to decree 443, issued in 1927. This allowed their establishment on the 17 August, just the time to sign decrees which wrongfoot the whole planning, including the quality of life which ought to increase and be maintained in our area, an area with hydraulic and hydrological problems.

Allow me to add that we do have a will, and that our internal determination endures, even if we it is getting harder to defend man's right to live in acceptable conditions. We talk about quality of life, but when a problem emerges it is always the mayor to be held responsible. But how conditioned is the mayor? How alienated is he?

Well, when we are dealing hydraulic and electric issues, which certainly affected the history of our land, of Schio, Valdagno, the Brenta valley, for it was water which once secured our wealth – we talk about 'brentane', not here alone, but also in Lombardy, which is telling about the destructive power of the Brenta, when it flows from the valley to the plane. We see ourselves with dozens of artificial basins no one regulates, no one is responsible for, so we personally have to take photos of them and inform the central authorities. This effort is unbearable. As for when we visit the Parliament, when the opinion of 11 ministers is required for any kind of planning for electric power development, the role of local services, regional and municipal administrations aside, we face inactivity; and when inactivity prevails, the stronger wins. Not to mention Enel, which never provides us with means of prevention; as local services we wish the State would assume its responsibility and preventively intervene, since it is possible to change or remove certain inconveniences without having the civil protection to intervene from the valley. We ought to organise ourselves for prevention, in such a way as to stop the Brenta from flooding at the same time as the Cismon, which is essential.

Moreover, we have to deal with Bassanini. Bassanini, when she arrived in the Veneto, delegated public works to the regional administration; the regional administration then delegated them to the regional council and provinces. The provinces are now dealing with the urgent work to be done about degradation and neglect, although they haven't freed the civil engineer of his responsibilities: so we

organised and mentioned the environmental problems caused by the dump on the Asiago plateau;[42] Fernando Donà [freelancer];[43] Fossua Bruzzo [citizen of Orgiano representing the civic petition against the railway link].[44]

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have provinces which haven't yet been vested with responsibilities, an enduring civil engineer, forest services for the upkeep of the mountain... we ought to make things simpler. I might work alone and assume responsibility for my work, but when there are ten of us confusion and neglect emerge. People's neglect of the mountain is probably the clearest sign of degradation; you mentioned sheep farming: I would like to point out that mountain pastures are a sign of vitality for the mountain, for the civic area.
I believe forced aggregation of urban villages at the piedmont was a mistake. We cannot make people live like in the XIX century: this would entail emigration in Brazil, as in 1872, when 350 fellow-citizens of mine left; we visited them in 1996 along with a delegation of mayors, and I found all the surnames of my parents. I am sure, then, that neglect is the clearest marker of degradation. This could have been prevented by inhabiting the place, since I believe that abandoned tracks, terracing and houses are a sign of destruction. Here, as in Japan, urban sprawl was so violent and intense that the problems of the mountain are even more evident, and they affect citizens even more, as in the case of the Venetian piedmont.
I cannot offer solutions: I would just like to point out that we cannot ignore the experiences and contributions from the land. This would be a serious mistake. I am not going to claim roles which are not my own, but I sometimes get the impression of being a clerk awaiting a judiciary communication about some malfunction or accident or road without signs, and I feel rather alone. At times, however, this loneliness allows me to meditate. Travelling by train, you often have two hours time to ask yourself: what am I doing? Am I really free from the leadership – for it is the leadership which give orders - or should I try and make the rulers acquire the people's way of thinking? It is often hard to transmit these needs to collaborators as well. I am here to say that I have not lost hope, and that we shouldn't lose hope. I believe that our connection with the land through democratically elected representatives, with the crisis of the party system and the exasperation of parochialism taking place, is a crucial element those responsible should deal with; not the parliament alone, which should be the first – but the parliament is so far removed –, but at least the regional administration, which should deal with it, and not through slogans alone. Three days ago I attended this conference, and I only hared slogans from the president. Both the planning and the new chart itself are based on slogans. Let me make this clear: I am not blaming Galan. All I want to say is that if we want a periphery government which can issue laws, and focuses on local issues, defending the interests of Lombardy, Piedmont and the Veneto, local institutions should take part with the little experience they have acquired and the links they have established with the people, which bears the history of the past on its shoulders to build the future. We ought to talk to these people, not through populism, but through assemblies. From my experience, which might be wrong, I believe we ought to meet urban planners, since they tend to talk little with people and leaders. We ought to link these two distant worlds. I really feel the need for this connection, this dialogue, this need to discuss and talk, not to convince other people, but to build a future.
Berlato Stella was an ANCI presedent in the Veneto for 5 years. After these 5 years I never had the actual chance of talking to a regional councillor or president again, or even with the representative of an institution, however small. I wouldn't like to speak with them because I think of being right, but because I feel the need to talk, and I believe they also feel the need to understand these issues and tragedies: if river floods, or a rock falls along the Valsugana, we have five billions from the Sarno law, and we cannot spend them. Why? Why all this monitoring? Why should we carry out these analysis and why is the civic protection not equipped? I can find an external studio to carry out my work, but I cannot spend three years, and my means of urban planning will be blocked. So I wouldn't like to give you the impression of great confusion. On the Asiago plateau they built villas, and now they don't know what to do with them, since they don't even own the houses they built, so to speak.'

[42] *'I would again like to point out that I believe Antonino Abrami possesses much talent. At times, one might forget about his vitality, but it seems like he has set something up which others have not managed to do in Venice, or in our region. I took these few minutes to tell you that mountain dwellers are not angry, they only need human dialectic; I believe that together we can improve the living conditions of the few who remain in the mountains, or else we will be left with tourism and speculation. We established a dump on the Asiago plateau, above lake Oliero, which they are planning to employ for the aqueduct. This is a crazy planning, and I can merely observe the situation and take some pictures without saying a thing. I don't want to be a protagonist, but to make these things known; we cannot go back and say: 'I told you so'. We have to meet and discuss about compatibility and protection. We can only achieve this goal with intelligence, a little modesty, comprehension, and the little experience we have all acquired over time.*
I have an agreement with the University of Padua, whereby we assist and give hospitality to those taking part in work experience projects. After giving hospitality to students from the University of Manitoba (Canada) for six and a half years, I set up the results of their studies on the Brenta valley in the new museum we have recently inaugurated. Of course, they visited Italy, and stopped at Oliero for a month and a half. We gave them hospitality for six years on a row, which is something indeed. What we need though is training, and the chance of organising meetings and discussions, which we are much in need of.'

[43] *'I work in the Vicenza area, which we have several representatives of here. On the one hand, I am truly enthusiastic for the urban planning work the Municipality of Schio, which I often follow, carried out; on the other hand, I should say that the history of the Municipality of Schio is what allows it to implement innovative cultural programs, as the Mayor previously mentioned. As I am liv-*

Day three [25.10.2003, afternoon]: CLOSING OF THE CONFERENCE [SALA DELLO SCRUTINIO]

THE ACTING PRESIDENT ANTONINO ABRAMI THANKS THE AUTHORITIES, THE SPONSORS, THE COLLABORATORS AND THE PUBLIC.[45]

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ing in the lower Vicenza area, I ought to say that it is the local administrations – we are probably dealing here with two very specific or exceptional administrators –, the local mayors themselves, who somehow planned our crazy development. So, I ask myself how it is possible for the example of Schio and Valstagna, or, in the case of Agenda 21, of the municipality of San Giovanni, to be apply, in a few decades time, to other, smaller municipalities, which are far less cultured than yours. I would then at least like the mayors of the province of Vicenza to do what they can to further spread this kind of sensibility, since in any case we few expectations, and no hopes. I would like to point out how even in the municipalities which are most interested and take more part in urban planning choices, an enquire, an analysis hasn't been carried out for years. Unfortunately, our regulation plans are all photocopies of photocopies, and the justifications are always placed at the end; in other words: we have few analyses, not only from the numerical point of view, but also from an environmental point of view, from the point of view of environmental awareness. I am here referring to the historical issues which might in some way make the task of the Municipalities of Schio, of Valdagno or of the area somewhat easier, while it leaves other municipalities, such as mine, in third world conditions. We have seen this with the most recent urban planning choices, and particularly in the case of quarries etc. So, on the one hand I am enthusiastic of the fact that some municipalities carry out these initiatives, but, on the other, I would also like to ask whether the financial balance of some of these municipalities, particularly of those open to Agenda XXI, benefit from State funding; if they don't, all these example are useful indeed, and might lead other municipalities in this direction, but unfortunately over such a long period of time that they will probably be incapable of assuring any vast benefits. I would like to point out that the first examples, at least for us, where provided by England, or, rather, by London, even if they were not applied very well in Italy and in the rest of the world.

Each people, each country, has a history and a culture of its own. The stimulus provided by this typically English project is no doubt extremely interesting for the economy of Schio and probably of the surrounding area. It might by useful for it to be divulged and expand. This new environmental sensibility towards urban planning, this new approach connected to a knowledge of the environment and a vast geological, and not merely social, knowledge, out to be divulged far more. Schio is not the only municipality in the province of Vicenza to provide us with this kind of information, and the province of Vicenza is not, at least in the North-East, or in the Veneto, that significant.

Unfortunately we are here as observers, and can notice a certain discomfort – at least from my point of view – rather pessimistically. Little or nothing has been done to tread a more sustainable path.'

[44] *'We are going to clash with a "political" culture, part of which is most useful for environmental values, for we are seen as enemies by these administrators.*

It would be most interesting to spread the attitude of Schio and Valstagna, this will to exchange, which does not exist in lower Vicenza areas. Actually, a kind of victimization of lower Vicenza areas in regard to upper Vicenza areas has developed: small municipalities – Schio, Malo – of the lower Vicenza area, where none of the big industrial conglomeration of the upper areas are to be found, exploit the need for de-localization, or at least the loss of interest in the sort of industrial development which took place in the 1960s, of environmental devastation in the 1960s, this disinterest, this different culture from the upper areas which now appears so precious for lower Vicenza areas. A 1960s attitude, therefore, is quite widespread among local administrators and mayors, as an attempt to completely control the situation. There is no exchange whatsoever, so I think it might be interesting, as a kind of provocation, to organize something with the mayors of the lower provinces of Vicenza, such as Schio and Valstagna, dealing with the examples provided by these small municipalities, such as Lonigo. The conglomerations I mentioned have about 3000 inhabitants, but their planning of industrial areas is frightening. They even 'valorise' the territory through settlements and cement. Industrial sheds they believe to be a form of valorisation of the land; these are all issues the municipal council deals with. This is also the case with mayors which implement changes the local population is completely against, with the help of the military police of the municipal council. In the case of a little town like Orgiano, where I come from, I change we strongly oppose is about to be implemented. We raised several points at each town council, which about 3 or 4 persons usually attend. There is lack of interest now for local needs and local issues, but in this case the hall was full of people, and the mayor had to use a microphone, and people had to stand in the corridor, since the hall wasn't big enough. And what did the mayor do? He always attended the meeting with 15 policemen. This is why I believe staging a meeting with mayor of small centres which have this kind of experience and culture would be most interesting: in cases such as this one people can notice how it is an actual matter of different culture, and not a mere environmentalist craze. Another world, a real resource, exists, and this is what development depends on.'

[45] *These are the words of thanks president Abrami used on behalf of the Academy:*

'We are waiting for the Minister of Community Policies; let us start our work in the meanwhile. I will start by thanking Nobel Prize winner Prof. Adolfo Perez Esquivel, the president of the Academy, thanks to whom we have gotten so far; I would also like to thank

SPEECH BY THE NOBEL PRIZE WINNER ADOLFO PEREZ ESQUIVEL[46] [with the showing of a

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the Mayor of Venice Dr. Costa, and our sponsors: the Veneto Region, the Municipality of Venice, ACTV, the Municipality of Schio, the Venice Casino. The fact that there are both public and private sponsors is in itself something positive.
I should also thank the organisers of the conference for the attention paid, for their attendance, and for the help they provided at times of environmental crisis, particularly on the first day. You can recall how the weather was certainly not very good; for this reason, I would like to thank the public for the interest shown and the incentives, reminders and questions provided. I am particularly keen to thank Antonio Amoruso of the Superintendence, a truly wonderful man I envy the administration for: I would love to have him working for the Academy or any other academic or non-academic facility...
I would also like to thank – and believe me, these are not merely formal, but heartfelt words of thanks – all journalists for the interest they have shown and for their spreading the news about the Academy: from Adriana Vinello and Andrea De Marchi, the two who are closer to us, to all others we have met and exchanged opinions with, trying to find new light, new ideas, and further guidelines. As we have seen, we are all in great need of this.
I would also like to thank the interpreters and stenographers for their professional help, flexibility and kindness. As you know, the longer these conferences last, for various days, the more one gets tired, and the more one can appreciate the kindness and patience of the organisation team.
The Minister for Community Politics, Hon. Buttiglione, is coming; let's all greet him when he enters.
After these necessary, but heartfelt words of thanks, let me spend a few words on our meeting. At the end, as mentioned in the program, I will outline some priorities, which I haven't personally established, I whom am a mere carrier, the expression of a will which has shown itself in this conference. First, I we'll reach interesting conclusions, to be followed with the utmost interest; then, Noble prize winner Prof. Perez Esquivel will talk about human rights and the protection of children, and show some pictures. I don't think I need to spend any other words of introduction.
Here comes the Minister, so let me end here.'

In the presence of the Minister and Mayor, Prof. Abrami continued to describe the course of the meeting, and its valuable scientific contribution; he then called on President Esquivel to speak:

'After the necessary but heartfelt words of thanks for all those who made this extraordinary three-day event possible, we were emphasizing our efforts to make some proposals, which I hope might capture the attention, and a desire for a greater insight, of all organisations, both public and private. As I previously mentioned, those who sponsored this meeting are both public and private groups.
Before calling on Noble Prize winner Prof. Perez Esquivel to speak, and allowing the other authorities to intervene, whenever they deem it appropriate, and before outlining a few conclusions and hearing from the participants, particularly from those who took part in our workshop, what the result of their work has been, I would like to stress an important aspect of this conference: for three days we have been eagerly involved, for a cold-blooded and detached involvement can hardly provide any solutions to this problem, the environmental problem we have hared so much about. We have been felling so passionate right from the first minute, and continue to feel it now as well, despite our tiredness, which you can tell from how I am losing my voice. I am not losing my voice because we have been shouting, dear Mayor, but because it has been a heartfelt, passionate and long conference. I wouldn't like to take any more time up, for we have precious people who are now about to speak. Let me introduce the President and Nobel Prize winner Prof. Adolfo Perez Esquivel, who will be talking about human rights and the protection of children, although Prof. Esquivel requires no introduction. There is a profile of him in our proceedings; the second part of the profile I have personally written, with a few but deeply felt words. Thank you, Adolfo.'

[46] *'Dear Minister, dear friends, I am most glad to be here with you, and to share the work we have done in these days on environmental issues, and which should help us think, share and establish new areas for the environment, with you. I was asked to talk about human rights and the protection of children. What have these issues to do with the environment? For several years, now, as Servicio Paz y Justicia we have been working with children socially at risk in Latin America. Millions of children all over the word are running their same risks.*
It is not easy to talk about the situation. I recall a saying, which goes: A disciple asks his master: "Master, teach me the way, with no words." His masters replies: "Well, then, ask me to do so with no words."
I would now like to make you think about a few things. This May, I went to Chapas, in Mexico, where we are working with the Indian communities on projects of development. A big international meeting was organised on the problem of militarization across the globe. I started talking to our Mayan friends, which share this ancient Latin American culture, and one of the issues we focused on was development. I asked them: "What does development mean for you?." They stared at me wide-eyed, repeated my question and asked me: "But what are you trying to develop? Is it more computers, machines, money you want? Is it more technology?". Again, I asked them: "But what does development mean for you?"; and they replied: "There is no such word in our language." They also said: "The word 'balance', and not 'development' exists in our language, balance with nature, our mother earth, and balance with God, the world and

video on the rescue of destitute children in Argentina, organised by Esquivel and his Association].[47]
Prof. Abrami thanked Prof. Esquivel:
'I would like to thank our Nobel ùprize winner for his words, which, as we all know, derive from personal experience: he saved and continues to save many children. He changed a slum by giving

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the universe." Then they added: "When this balance is broken, violence follows, because the harmony of the universe is broken." Let me repeat this: when balance is broken, violence follows.
We are now living in a violent world, because this balance has been broken. Wars, conflicts, vast economic problems.
We have long talked with our Mayan brothers and sisters: how can we re-establish this balance? This balance ought to start from one point, from human interaction, because we can spend a long time discussing without ever reaching this balance; we can have brilliant, marvellous ideas, but without balance they are useless.
Another thing I would like to mention, something which really moved me, and which moved us all, is the atrocious 11th September attack on the Twin Towers at New York. This act of terrorism was atrocious, and destroyed the life of thousands of people. This is truly terrible. I was at Porto Allegre at the time, attending the World Social Forum with the Governor, for the opening of this social forum. When the news of the Twin Towers arrived, another news arrived, which deeply moved me: according to the FAO, more than 35.000 children in the world had died of hunger that day. How can we describe this? More than 35.000 die of hunger each day, as if various Hiroshima and Nagasaki bombs were released. Hunger is a silent bomb. How can we call this situation? We can call it economic terrorism, which causes an inequality which is responsible for the death of more than 35.000 children each day. This, gentlemen, is the reality. In a world were numerous chances of finding a solution to the issue of starvation and diseases, not to mention war, the military budget of the United States is of 400.000 million dollars. How many schools and hospitals we might build, how many problems we might solve with this money!
We cannot deal with the issue of these children as if it were an isolated problem. No, we have to deal with the issue of these children in the context of humanity at large and what is going on today in this small planet of ours.
The other day, I said that we should regain the energy of our words. Words are energy: the human being can achieve wonderful goals, build and destroy. We ought to take collective decisions to change the life of peoples, to establish a better, more human and brotherly society.
We are talking about human rights: human rights are inseparable from the process of establishing democracy. Democracy means the right to equality for all, and not a few alone. The destruction of goods.
In these days, I mentioned a friend, Eduardo Galliano, a great writer from Uruguay, who talks about Latin America and has written wonderful things. He analyses reality. Eduardo Galliano writes: "in a world without a soul, we are forced to accept the fact that there are no peoples, but merely markets. In a world without a soul there are no citizens, no human interaction, but competition alone." We then ought to see what the condition of human beings is, and what is happening to children, in this context.
We are working with street children, children who live in the streets, and trying to provide them with a meaning in life. I will now try and explain a few of the projects we have developed, and you will soon see them on the screen, while I continue to explain my way of thinking.
We have established small villages, to give these children a chance; no doubt, we cannot personally solve the problem, but we can certainly say that these problems can be solved: our goal, with the World Social Forum of Porto Alegre, is that another world is possible, and we believe it is possible to reach that world. The students at Paris in May 1968 were creative, imaginative, and used to say something which greatly impressed me: "we are truly realists, and are asking for the impossible, for the impossible is possible".'

[47] *'When we talk about the human rights of children, we refer to the International Convention on the Rights of Children. All UN countries signed the Universal Declaration, International Pacts and Protocols, but these international pacts, agreements and protocols should be enforces, and become a kind of energy for peoples' conscience.*
We are working with families on the streets; a street child is not on the street because that's were he wants to stay. Police treat him like a criminal, a thief, but these children are the victims of an unjust society. What we are trying to do is to inform children of their rights. At times, the State steals these rights from them and instead of protecting them, turns them into criminals.
What we are trying to do is to give birth to a different conscience. With the small villages we have establish we try to provide a sense of freedom, for without freedom there is no love. This freedom inside us we have to fight for. Freedom is not handed out as a gift: it is something we have to acquire and acquire by resisting, culturally resisting, in the name of ethical values and the collective conscience of the people. This alone allows us to turn a world of oppression into a world of freedom.
A great French poet, Feuilleron, who was working in leper hospitals, expressed a conscience of humanity in his work and stated that 'no one can be happy alone: we have to be happy in a community, together, we all have to be happy and achieve this freedom.'
What we are trying to achieve with these children is to instil them with a critical conscience and with values. In a global world such as ours today, in which we might define two great goals, if we accept the fact that there is to be no way out, then the abyss, the destruction and death of all cultures, the death of identity, a spiritual death of all values is inevitable.

jobs and teaching these boys new trades; he provided these children, which had often been completely abandoned, with a meaning in life, thanks to his deep Christian spirit and Catholic faith, and to the love, the passion he has and we have felt.

However we may feel about this message, it is no doubt a powerful one. You might recall the speech Prof. Esquivel delivered the other day on cultural and territorial identity:[48] that also deeply moved us. I would like to thank him, then, for his words.'

Eduardo Galliano calls it a world without a soul. What we have to do is to build our own idea of a collective human conscience, based on an identity of value. From here we can start to build. It is a huge challenge: we do not have answers to each questions, but we are aware of the fact that things can change.
We are not in Latin America, or in a poor country, nor is Argentina a poor country: it is an extremely wealthy country, which produces all sorts of foodstuffs. Yet, out of a population of 37 million, around 23 million live in poverty. Around 10 million are destitute, and if their children don't die of starvation, they die of illnesses, although – let me point this out – we are living in a democracy. What is a democracy? Re-thinking the democracy we are living in is a big challenge.
At times, we confuse democracy for the right to vote. Democracy means rights and equality for all, it means the rule of a lawful State, of equality and equal opportunities for all. But when children are born who are already doomed to a certain death or a life of injustice and immorality, through prostitution, drugs, minor employment, what future awaits them? Where are the ethics and spirituality here? Yesterday, I mentioned how a child represents all the children of the world, and how all the children of the world can be identified with a child. What we need to understand is: those are the values, and what can we leave this children when they suffer social violence, structural violence, and often also family violence?
Through our work we face many problems: pregnant teens, abandoned babies, and what we ought to give birth to are policies. We face huge difficulties in terms of law and legislation. These children, many of these children, live off rubbish. They gather cartons and papers they sell, some times with their family, other times alone. We then have this International Convention on Childhood from the United Nations, from UNICEF and many other organisations.
A friend of mine once told me that a three year old child was looking at a map of the world and saying: "the world does not know where his home is, we know were our home is: our home is this little planet Earth, this is our home". This is our home and here we have what the other day I called our Mother Earth. For this reason, the work we can do with the Academy is even more important: by dealing with the environment, the Academy is also dealing with humans. Humans are our aim.
What I usually say is that we can build the future with our courage to build the present. There are no other solutions. Tomorrow we will reap the fruits of what we sow today.: the memory, history and life of people. A people which ignores its own children is a people which has lost its soul. A people which does not cure its children with dignity has lost its own dignity.
Once again, we have discover ourselves as critical beings, being with a critical conscience, in order to understand and be able to distinguish real values from anti-values. Thanks to our experiences we can say: change is possible.
In one of my books, I claimed that if there are no more utopias we should reinvent them, for we cannot live without utopia; those which started off as utopias are now reality. A place which we can extend our experience to.
Here in Italy a great pedagogue, Tonuzzi, talks about cities for children. These are not cities built for children, but for adults, and often young people find no place in society. These children will soon become young adults and then adults: what future awaits them? For this reason, when we deal with such serious issues, for instance with the death of so many children in the world, we should ask ourselves: what future for humanity? Were are we heading towards?
I would like to end with a few examples. When children reach us, they arrive with a huge store of violence. Out of ten words they might speak, nine and a half are insults. Communication among them is violent because the world they have lived in is violent. How can we change this violence? What can we do? We are making new discoveries and learning along the way. The first tool we have developed is dialogue: how can we talk with them and listen to them? One of the most serious problems is that usually we only listen to ourselves, and are incapable of listening to others. This is a huge problem.
Besides the crucial goal of dialogue, we also aim not to ever lie: we must always tell them the truth, without ever lying. if we lie to these young people, we are using violence, terrible violence, and frustrating them. We have to be coherent in doing what we say. These are ethical values. There are many other examples we can refer to mother nature. At times we look without seeing, while we ought to discover life through our gaze. We possess no formulas. It is a method of education, whereby, to quote the great Brazilian pedagogue Pablo Freires, the teacher is also a student and the student is also a teacher: we ourselves learn much from children, and children learn from us. But was is crucial, is that they may learn to smile at life. This is what counts.
Last week, during some village meetings, a little girl came up to us and said: "Do you know, Sir – children call us Sir – here I learned what happiness is." This is the greatest reward for us. An ancient Sephardic saying goes: it's always darkest before the dawn. We have to aim for this dawn of life: the greatest reward for us is when these children start smiling at life. Thank you for your attention.'

[48] Cfr. Esquivel's speech above [morning of the 23rd].

GREETINGS AND WORDS OF THANKS FROM THE MAYOR OF VENICE PAOLO COSTA:

The Mayor first thanked Prof. Abrami and all the organisers and then stressed the importance of the Academy for Venice.[49]

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[49] *'I would like to thank Antonino Abrami and all those who have been working these days to establish the International Academy of Environmental Sciences, and have been present here at Venice for its opening.*
I must confess, that after Perez Esquivel's words, it is hard for me to follow an official line of reasoning. What I would like to do, then, is spend a couple of words partly to greet, and partly to thank, and to recall his emphasis on human rights and the human rights of children, the most defenceless of all creatures on this little planet Earth, as he was saying. The rights of each human being, which should be extended and defended on the whole planet, bring a less vague and less technical idea of the environment in mind. One cannot deal with environmental issues without dealing with its subjects from a humanist point of view, by favouring a view which sees man merely as one among many species. Reminders and suggestions would lead us quite a way, and this is not the appropriate moment, although I would like to thank you for these suggestions.
As a contribution to what we have been discussing, I would like to say a few things about Venice in a most traditionalist fashion: often, when I attend a conference or some kind of meeting in Venice, people ask me whether it has some kind of link to the city; in this case, the link between the issues discussed and the place where they are discussed is rather obvious, for Venice can be seen as a kind of metaphor for ante litteram environmental sustainability. This place challenged the environment, at times in ways we would probably avoid today: would we build a city in the middle of the lagoon today? Would we go through the same toil? Would we have any rules or laws allowing us to do so? I think not. The history of Venice, then, is no doubt an environmental challenge accepted and resolved in terms of what we would call environmental sustainability in particularly distinctive moment in the life of humanity. The history of Venice unfolded through the centuries as man suffered because of the environment and tried to affect it through environmental challenges to the lagoon, the sea and land, through which he was in any case incapable of reversing this subordinate relation. When he became capable – and I am here talking about industrialisation in all the world – of modifying the environment, and became too powerful, he ran the risk of damaging Venice and being unable of adjusting his instruments.
I believe we can interpret the history of Venice, then, as that of a place which abandoned historical sustainability, which is rhetorically referred to as the 'good old days', to turn into a place which is environmentally vulnerable to the extreme and might face a catastrophe. It is in terms of vulnerability that we can interpret all the environmental crimes we deal with today. After all, the very origin of the city is at risk: its air, water, soil and population. Moreover, Venice, thanks to its historical challenge and its being so close to water, also acts as a thermometer. What place is more affected by the greenhouse effect and the rise of the sea level, whether it rise of few centimetres or several metres? Were it to rise of several meters, things would get a little complicated. It is not by chance that Venice, its population and administration, have also tried to make their little voice hared when the Protocol of Kyoto, for instance, had to be approved. Venice has a vital interest in this, because, by being at the limit of sustainability, it measures this risk every day. That is to say: if the world behaves well, Venice can have a chance; if it doesn't, Venice might face serious problems in the future.
It is because of this vulnerability that in the last fifty years we realized the kind of risks we were running and tried to correct our mistakes. We are now trying to correct our mistakes through new laws, new technologies and juridical interventions, by asking for absolute reparations and making those responsible for pollution pay – a principle that is not actually always applied. We are dealing here with emblematic issues, which are not characteristic of this place alone, but we experience here more extremely.
I will not discuss the issue of protection from high tides, which has already been discussed. In the debates which have taken place on the issue in the past years, we have seen how it can be divided into the issue of protection from the big flood, and that from everyday tides, which mostly affect San Marco and Rialto, and for which there are no big project, and I would like to intervene in a more limited and specific way. I could mention the history of interventions which objectively restored the quality of air and water, while the quality of the soil we still have to restore, and the vast industrial development on the eaves of the lagoon which affected the environmental balance of Venice and of its lagoon for many years. We are now gradually reabsorbing it through a long-term strategy which deals with these emblematic issues.
The fact that in a week's time, thanks to the generous contribution of the European Union – and I here refer to Minister Buttiglione's authority – we will be inaugurating a vast park which used to be a waste dump of 75 hectares. It is now the biggest urban park of our region, and a sign of it's recovery. We are investing in an area around Mestre to establish a 200 hectares grove: our society is thus reacting, building and healing its wounds. I might also mention the experiments of tourist sustainability, since this city suffers from a huge disproportion between visitors and residents; this affects the whole heritage, and is closely connected to the issue of sustainability we mentioned. I might give you other details, about how we are trying to change people's behaviour, for instance in terms of the consumption of energy and energy saving, which, I believe, is carried out more than in any other area of Italy.
Let me end now by emphasizing how ***Venice was the historical, ideal place for ante litteram environmental sustainability. After turning into an environmentally vulnerable place, it is now moving again towards sustainability through a process which requires it to be active and capable of returning to its starting point and assuming its role in the protection of its integrity and the respect of its environment and lagoon. It role is that of leading a debate on peace and worldwide contact, not least through the Academy we are here celebrating. Many thanks for all the work you have done for us.'***

The Mayor ended:
'Venice was the historical, ideal place for ante litteram environmental sustainability. After turning into an environmentally vulnerable place, it is now moving again towards sustainability through a process which requires it to be active and capable of returning to its starting point and assuming its role in the protection of its integrity and the respect of its environment and lagoon. Its role is that of leading a debate on peace and worldwide contact, not least through the Academy we are here celebrating. Many thanks for all the work you have done for us.'

HON. ROCCO BUTTIGLIONE, MINISTER FOR COMMUNITY POLITICS, mentioned the wonderful, almost miraculous atmosphere of Venice, which inspired great poets. Among them, Ezra Pound, who called it a reflection of the shadow of the glory of God. Hon. Buttiglione then emphasised the close connection between humans and the environment: 'beauty is closely connected to human work, beauty is functional.'
The Minister pointed out:
'at times it might not appear very functional to us, but everything which has been made here according to beauty was at the same time extraordinarily pragmatic. No building was erected for tourists to admire it. Each building was erected for a specific function, usually a commercial, administrative or religious function, by a generation of men who were endowed both with a taste for work and business – this is a great business city – and with a taste for beauty. It is this synthesis which marked this land.'[50]

Hon. Buttiglione then considered an issue the Academy devoted much attention to: the idea of ENVIRONMENT.[51]
The Minister mentioned how the word 'environment' is UMWELT or UMGEBUNG in German, and how these two are double words, composed of two terms: UM which means 'around', and WELT, which means 'world', while GEBUNG is the sum of data.
The very idea of environment, therefore – Hon. Buttiglione emphasised –, is directly connected to that of man, as Perez Esquivel mentioned, because we can only imagine an environment in relation to a human subject.[52]

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[50] *'The city is deeply affected by the lagoon, and the lagoon would not be what it is without the city, not least for the work men have carried and incessantly keep carrying out in the lagoon to keep the city alive, dear Mayor. I am thinking here about the MOSE, the most recent vast process through which man is trying to regulate natural processes.'*

[51] *This leads us to the discussion of what I believe to be a central idea in our debate: the idea of environment: what do we mean by environment? I recall an article by a great German philosopher and friend of mine, Robert Spiman, who was once pondering on the issue. The German word for environment is Umwelt or Umgebung; both are double words, composed of two parts: 'Um' means 'around', and 'Welt' means 'world', 'Gebung' is the sum of data. The idea of environment is connected to that of around: around what? Perez Esquivel told us: around man. We can only imagine the world in relation to a human subject.'*

[52] *'The environment cannot exist without man. Perhaps, there might be some part of the Amazon which has not been affected by humans, but I doubt it'* the Minister continued. *'The environment we know and love, this Venice of ours, this Italy of ours, has been shaped by man. It is man who regulated the flow of the lagoon, who drained marshes, sowed crops, terraced mountains and felled forests.*
The environment we are defending cannot exist without man: it is a correct balance between man and the environment. Since, from the merely natural point of view, from the point of view of a nature free from man, man is in any case affected by natural processes: the desert, carbon dross in Wales or around Glasgow, and the very Amazon forest, are natural processes which produce various effects. Why should man preserve his environment when all species survive by destroying the environment they live in, and the ecological balance is always precarious?
What is the difference between man and the other agents which interfere with the environment? Man is far more powerful, more pow-

After Ezra Pound – the Minister recalled – it was Johann Paul II who focused on the issue in his Centesimus Annus encyclical introduces two fundamental concepts. The first states that God, who created the earth and entrusted it to men, entrusted it to men in such a way as for them to use it for their own sustenance and to take care of it, the two things going hand in hand. Man, therefore, ought to "draw his own sustenance from the earth, while at the same time taking care of the beauty of creation which was entrusted to him, and make sure that each thing in nature might develop according to its purpose; beauty is the product of the fulfilment of the purposes inherent in nature.'

God created the earth and entrusted it to man, but man's enjoyment of it must not be morally unsound, since all have to enjoy the goods of the earth:[53]
Hon. Buttiglione stressed the idea of MORAL ECOLOGY and the fact that the balance between man and nature gets constantly broken and needs to constanly be restored.[54]

It is here – the Minister emphasised – that politics has to 'establish guidelines' to allow us 'to find the correct balance between man and other men, and between the natural environment and man'. This balance can be restored 'through trial and error' since 'no one knows the solution for a perfect society.'
The EU is working on projects of great interest:
'What is the European project we are working on? It is the project for a democratic market, for a social market economy, i.e. for a market open to all, and which can sustain all. We are working for the establishment of a democratic market and to remove all those conditions which make the market open to some and closed to others. This is working for Europe. the European project is that of extending it to other countries with the enlargement of the EU. Globalisation: enlargement means governing a piece of globalisation, 100 million people.'
'Those 100 million people make a difference between despair and hope'. The project should also be extended to Russia, the Mediterranean and Africa, where 'economic and material problem intertwine, in a close connection, and the issue of immigration has also economic causes – economic backwardness; bear in mind, that migration is also caused by a terrible natural catastrophe: the desertification south of the Sahara.
The desert is advancing: men are losing their farms, conquered by the desert, and migration often follows.
Therefore, it is necessary for us to make an investment to bring water south of the Sahara.'

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erful in protecting this balance and more powerful in destroying it. In a few years time, man can realize the kind destruction other animals bring about in millions of years. On the other hand, man can preserve the environment, better it, and preserve the kind of balance that makes us say "it is beautiful" and "this is truly an expression of the glory of God."

[53] *'According to Thomas Aquinas – Hon. Buttiglione recalled - men ought to take care of the earth and divide it in such a way as for each on to take care of part of it. Private property, and private ownership of the means of production, are the best way for men to take care of the earth and provide for their own sustenance.*
Johann Paul II, in his Centesimus Annus, and in another great encyclical of his before that, the Solecitudo Rei Socialis, stated that this is certainly true, provided all men can live, because if private ownership of the land and of the means of production, is structured in such a way as to deny some people to access the market and enjoy the products of the earth, then the system becomes ethically unsound.

[54] *'If the earth exists around man – Hon. Buttiglione continued –, the earth needs sound, just relations among men. These are always difficult to achieve. Consider the miracle of Venice: look at the beauty of this hall, which is itself a miracle of art. Look at the paintings: partly, they depict battles; I can see the battle of Lepanto, the fight for the Peloponnesian isthmus... and why? Because history is also the history of a difficult balance – peace among men – which is constantly lost and has to be restored. The balance with nature is constantly lost and in need of being restored. This balance is not something given, nor are peace among men and a correct balance with nature a given. When the balance is lost, our morality tells us that something is wrong, and fills us with horror.'*

For this reason – Hon. Buttiglione said – I consider it praiseworthy that the Italian government, with this recent financial act, provided a funding of 70 million euros to bring water south of the Sahara, together with the FAO and other organisations which are collaborating in the hope that others too might play their part, since bringing water south of the Sahara is a matter of fundamental importance for the life and development of those populations.'

Hon. Buttiglione then emphasised the great importance of water, the lack of which has even more grievous effects on the world than hunger, since[55] 'There are many more children dying of illnesses than of hunger; and these illnesses are caused by the contamination of water, since the sewerage is not clearly separate from the human water reserve. Those who die of hunger often die because there isn't water enough to irrigate the crop-bearing fields. We have to bring the issue of water to the attention of our people today.'

The Minister then mentioned the issue of starvation, and provided some information on the country's commitments.[56]

A great Polish poet, Cyprian Kamil Norwid, once said that beauty exists to make work likable and allow it to flourish. There can be no human civilisation without the connection of these two elements: work is beauty, and beauty is the beauty of the arts and of nature, a creation of the environment.
At a European level, we have focused on a different issues I would like to draw the attention of the Academy towards, so that it might ponder the issues and offer some contribution. We are working on a big directive on chemical products.
Life in the world today is marked more and more by chemistry. You are now all wearing clothes which are more likely to have been coloured, waterproofed and treated in various way with a number of chemicals you probably cannot even imagine. Many of these chemical products are new; there are chemicals which have been used for thousands of years, and you might be wearing fabrics of the kind shown in these paintings, and which are most likely not to be particularly toxic. There are many new chemicals, however, which might be used for your clothing, the bricks in your houses, your cars, etc.: the number of chemicals used has grown tenfold in the past years, and much of our well-being depends on the progress of chemistry. Yet, we still haven't a clear idea of the effects all this might have on our health and the environment surrounding us. Hence, the need to check the

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[55] *'You often read that many children are dying of hunger, as Perez Esquivel also reminded us; but, mind you - in comparison to the problem of supplying water, famine is a relatively minor problem.'*

[56] *'Another thing I would like to mention about this issue, is the so-called 'de-tax' financial act; we would like each shop to chose a governmental project and to devolve 1% of the taxes it owes the State to it, in such a way that 1% of the taxes from the money you spend at the at the supermarket might be devolved to a development project of your choice, since it is unimaginable for us to finance development merely through the resources of the State: we need to get everyone involved. The State must play its role, but de-taxing rather than merely allocating funds.*
Our aim is that of increasing the percentage of State revenue used to fight world starvation to 0,33% by 2006. This is 0,33% of the Italian gross domestic product. This might seem little to you, but it is in fact a difficult goal to reach, since the same people who are moved by the initiative react when there is a tax increase or when public services diminish, and say: "No! Are we crazy? There are more important things!." On the contrary, we believe this to be an essential thing.
From the beginning of this legislature we passed from 0,13 to 0,20%, but a lot remains to be done. The 0,33% is not only an Italian goal, it is a shared European goal. If we reach it, we might double, more than double, the sum employed in 2001. This might allow us, if not to reach, at least to get near to the goal set by FAO: the halving, I believe by 2020, of the number of people living in extreme poverty on the planet. A planet which to draw resources from and to take care of for its beauty.'

situation and reach certain guarantees.
This issues is a particularly delicate one, for we are all living in a world where certain countries, such as China, have no environmental control over the use of chemicals, and other countries, such as the United States, which carry out few controls.
Lastly, the Minister discussed the directive on new chemical products. He emphasised the fact that citizens have the right to be informed, and hoped that as many citizens as possible might take interest in the issue and for new research to take place on the technical side of the matter. Can we place such a burden on the European chemical industry as to remove it from the market and make 5 and a half million people in Europe lose their jobs? We cannot. But neither can we allow things to remain the way they are. Here the need arises, to provide citizens with some answer. What we need to do, is to find 'the correct balance', since this is 'a difficult problem,.... an open problem...'[57]

'The issue of our directive on chemical products – Hon. Buttiglione said – is of crucial political importance for our future, our economy, employment and health. I believe it might be worth focusing on this issue.'
Hon. Buttiglione then mentioned the hoary problem of the Mestre line, a road which 'was no doubt a significant factor of environmental pollution with its traffic load'. Given the controversy with the EU, the issue was kept 'hidden', for it was impossible to proceed. Now that this European case has been solved, the line will be built.
Hon. Buttiglione then recalled the complex issue of the highway system, which we should 'study... through new high-technology systems which can allow us to check the level of traffic pollution.'
The Minister pointed out it is necessary to:
'Build an inter-modal system, a cargo exchange, an informatics system which allows operators to know what cargos other have,[58] to exchange cargos, in such a way as for those with half a cargo to pass on to another one with half a cargo: travels full, while the other awaits to travel full. A satellite network monitoring, which allows us to know the time required for each walking operator to cover the necessary distance, means making the best use of all existing structures, while new ones become available, and significantly lightening the volume of traffic.'
To sum up, then '…the issue of chemical products, ...the issue of traffic volume, the issue of a logis-

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[57] *'An issue we should get more people involved in, because it is a technical matter, but also a political matter which affects us all. In order to get citizens involved, we need a research effort which might help us formulate clear alternatives, for citizens have a right to information; getting citizens informed means studying the problem in such a way as to make it accessible to citizens...'*

[58] *'The Mestre line is not an isolated case: – the Minister pointed out – the Italian highway system is about to collapse. Highway pollution is a great threat for the Alpine environment. A country bordering with ours decided not to let us through, but we cannot accept this because 50% of our export passes through Alpine passes. Were we to close these passes, we would die. So we have engaged in a battle to remove the impediments posed, and I think we have won. This is again a matter of balance, but what can we do? Can we go on like this? We cannot. When we are talking about something like the Brennero tunnel, the Gottardo, Lion-Turin tunnel, we are dealing with the issue of the highway system, but also with environmental balance, since building these tunnels, turning today's highway traffic to railway traffic, requires exercising a strong pressure on the environment. We can achieve this goal in ten years' time, for no vast project can be carried out in less than ten years. But what can we do in the meanwhile to reduce traffic levels? These are political issues of cultural and environmental relevance. We are working to develop an Italian logistic plan. What does this consist of? We have many half-empty lorries on the road, which leave from Catania to deliver something at Hamburg, and return empty from Hamburg. These are all matters an environmental policy has to deal with, trying to meet human needs. An environmental policy of the kind certain environmentalists carry on, making absolute claims such as "this is the environment, it has to be left alone, it would be better without humans", is destined to failure. This is the kind of neo-pagan environmentalism, represented by a cult of Gaia, which treats men like parasites or bacteria of this living creature, Gaia, the earth. Instead, what we need is a concrete environmentalism, capable of dealing with problems and providing balance-creating solutions.'*

tic plan, the issue of Pontebbana,... of building highways on the sea to directly unload lorries at Trieste, and to carry them from Trieste by railway to the north, since we make little use of our railway line' are 'all issues we have to focus a complex political reflection on. We need scientific support, and have to understand things in order to provide citizens with some choice, so that they may take some decision when faced with clearly formulated, clearly understandable and clearly documented alternative options.
For this reason, I would like to thank you for the work you have started, for the cultural approach you have chosen, by considering the environment not as something man is a parasite of, but as what surrounds man, since man cannot live without taking care of his cultural environment.
Heidegger said something of the kind when talking about the shepherd and being: this is not about being, but rather about nature. It is different, but, as Cacciari would say, rather similar.'
The Minister finished with the words: 'I would like to thank you for this approach of yours. I would like to thank you for inviting me, and I hope not to have bored you or to have taken to much time up. It seems like no one has fallen asleep yet, and this is already something.'

Prof. Abrami showed his appreciation and thanked the Minister for Community Policies:
'Dear Minister, I would like to thank you. We do not know each other: we only met once. I am a straightforward kind of person, and I would like to point out – all formalities and required words of gratitude for your attendance aside – that you have dealt with important issues for us, starting from the issue of the environment, the basic meaning of which is rarely discussed.
It is not by chance, that we are focusing on the issue, as our chart, which will soon be handed out, will show. Let me also mention, that it will be published on the internet, in such a way as to give all groups and institutions a chance to provide contributions the Committee of the Scientific Council of the Academy will later assess. We chose to talk about the environment, starting from the very concept of environment.
The issue of the environment, it has been said, is not merely a matter of natural resources, but about the relationship of man to the environment, and about cultural and historical identity and its protection.
Having said this, I should also point out that the drafting of the chart has been the toilsome product of many months' collective work, now enriched by the contribution provided by this conference. The lexical and historical-juridical and scientific research has been accompanied by an attempt to develop proposals. I ought to point out how this effort of ours seems to be in tune with the philosophy you have discussed today, Hon. Buttiglione, which is what has most struck me of the things you said, and what I would like to thank you for. In particular, I would like to thank you, as well as for your culture and quotes, for trying to deal with grievous issues such as the lack of water in the Sahara, a matter of great political and environmental importance; the fact that thanks to you 70 million euros have been devolved is in itself praiseworthy.
As for all other problems, the issue of chemicals is a huge matter of precaution, which requires clarity. Even at a scientific level, we find different stances, since the idea of risk depends on the likeliness of an anti-juridical event taking place with certain consequences. It depends on the likeliness of a certain action being successful. So, for instance, if I were now suddenly to throw a stone through this window, while I speak, the huge damage to the historical and artistic heritage aside, will I also endanger public security? What is the likeliness of me hitting that historical and artistic heritage?
So the jeopardising of material goods and cultural resources, or of public security, depends on the likeliness of my action being successful. We would then have to assess my strength, and all other elements. In the case of the environment, this requires a far more complex evaluation, since the

nature of the source, the quantity and quality of the pollutant, the receiving body, the period of use of the pollutant, the ways it spreads, must all be taken into account. This is were – and on this note I will end – were the other aspect of great interest, we have been focusing on for such a long time, come in: the need for the use of technologies.
We have launched this idea, dear Minister, of an inter-disciplinary satellite atlas which can monitor the whole earth. There has been a vast consensus on this matter. I can certainly say – among us there are representative from Telespazio and Enterprise – that I did not know one could historically trace the changes of an environment up to 25 years before. Talking with our speakers and friends from Telespazio and Enterprise, the fact was later confirmed.
This is something extraordinary. This is also what the right to information is for: by basing ourselves on these points of reference alone, we can plan any kind of intervention, including political interventions, dear Mayor.
I would then like to thank both our Mayor and Minister Buttiglione.
We will continue with our work, which consists of the conclusions and proposals made by our workshops. The representatives of the various workshop groups will be speaking; then, after a few closing words of mine, the contents of our chart will be read out. Thank you Mayor, thank you Minister, and thank you dear Adolfo.

CONCLUSIONS AND WORKSHOP PROPOSALS
PRESIDENT ABRAMI'S CONCLUSIONS
AND
READING OF INTERNATIONAL CHARTER FOR THE STUDY AND PROTECTION OF ECOSYSTEMS

READING OF PROF. ESQUIVEL'S MESSAGE
Greetings and closing of the Conference

CONCLUSIONS AND WORKSHOP PROPOSALS

Could Prof. Trott, from the 'Health and environment' workshop, please join us? I've been told the various workshops met, and we are about to distribute our chart. As we have seen, it will be published on internet, in various languages, and is open to discussion, if anyone would like to intervene.

We will now know what the references, criteria, and the most important things which emerged through the workshop. I have already spoken about health and the environment with Prof. Cartei, but I would like Prof. Trott to sum things up. Thank you.

2nd Workshop 'Health and the environment'

Klaus Rudiger Trott

Thank you for inviting me to sum up the discussions we have carried out in our workshop on health and pollution.

We have carried out a fruitful discussion on a wide range of pollutants which can harm human health: smoke, virus, asbestos, cell-phone electromagnetic pollution, the Chernobyl follow up, etc. Several studies have been carried out on each of these pollutants to measure the hazards they pose to human health. The damages caused to human health range from respiratory stress among adults to asthma among children who have been exposed to air pollution. In eastern Europe we find the so-called black triangle; we have hared a paper about its terrible long-term effects, cancer in particular.

Information on the risk of developing cancer is apparently uncertain and varied. Many epidemiological studies lack the sufficient follow up time; this is for instance the case with the studies on the use of cell phones and its correlation to cancer: they are too short-term to give us any idea. No preventive action, however, can be carried out without rational and scientific basis.

We have agreed on the fact that an environmental protection strategy cannot be based on the number of deaths caused by a certain cause. It can only be implemented on the basis of hypotheses. And yet, scientists cannot make certain decisions by establishing priorities, because in the future no certain proofs will be available anyway. Scientists cannot offer certainties, but only advice, and it's not up to them to make decisions.

It is the representatives of society who have to make these decisions, for if society is to make any decision it has to be informed. We all agree, then, that environmental protection is more about the quality of life than about objective numerical valuations of the level of risk. The quality of life cannot be measured by scientists: it consists of what people perceive as the way they want to live.

If we are to live and work by making decisions which are not merely based on emotionality, scientists ought to make a great effort to educate the public. For this reasons, scientists have to work closely together with journalists and other communicators, with legislators and those applying the

law. This meeting of ours is a promising start to this activity, bringing together, as it did, various representatives of our civilisation and communities: legislators, resource managers, scientists and journalists, who are the essential link between these working and scientific communities and the public. This will be the role of the Academy in the future.

Antonino Abrami
Thank you, Prof. Trott.
Given the increasingly rigid climate, I will try to be as succinct as possible in delivering the message of the Third workshop and reading out the conclusions it has reached.

3rd Workshop 'The protection of the urban ecosystem'

After papers and debates with urban, environmental and administrative authorities, the workshop on the protection of urban ecosystems unanimously invited the Academy to act as an interdisciplinary service to provide the organisations and associations representing local communities, municipalities, provinces and regions, and environmental groups, committees, etc. with the necessary information. Information about specific issues related to both prevention and restoration work, in order to provide environmental sustainability with scientific and methodological concreteness and to tie it to a range of local experiences and situations, to human history and to the life and work specificities of human communities. Allow me to point out how all these aspects have also been dealt with in the Charter. Before reading out the Charter, a copy of which can in any case be taken at the entrance, I would like to call upon Prof. Conti to speak for the last workshop, that of nature.

Workshop I 'Protection of the natural ecosystem:
protection of the marine ecosystem and of the fluvial ecosystem'

Marcelo Enrique Conti

Thank you. I will keep it short. Much of what we are about to say has already been said by Prof. Trott, whom, of course, we agree with. I would just like to add a few things which came up in the course of our workshop on marine ecosystems and fresh water ecosystems. Basically, we would like to see more studies on impacts on the various marine ecosystems, and the creation of more data to be used as a reference to address the notorious problem of environmental prevention, possibly in a court case as well.
The idea of an environmentalist ethic has emerged in the words of our colleagues who took part in the two workshops. We would like this idea to be included in the Chart, since a correct protection of marine ecosystems, and the use of inclusive environmental management models is not possible without it.
One of the greatest challenges – as chancellor Ghetti explained – is that of governing artificiality. To govern artificiality, we need to adopt environmentalist ethical principles, always with the nature-man relation, man's history and the ancient use of resources in mind.
Lastly, we feel the need to pass from a quantity of data to a quality of data, bearing in mind that quantity does not always imply quality. We ought to pay greater attention to the quality of our data, particularly in terms of analytical methods and their control. Therefore, here is a last word of advice on the use of quality markers for ecosystems: we need few but highly indicative markers which can help us to better understand that principle which has over 160 definition, i.e. sustainable development. Thank you.

Antonino Abrami:

I would now like Prof. Pedrotti to discuss mountains, before we establish our priorities.
In order to make our debate more direct, broader and more detailed, we have chosen to use the internet, and to publish the Chart on our website: http://www.environmentscienceacademy.com. Clearly, the Chart will be translated in various languages and published along will all the papers which have already been handed out during this meeting. The folder also contains a CD; soon, a DVD with the audio and visual recording of all our work will also be made, and we are hoping to provide an English version as well.

1st Workshop 'The protection of natural ecosystems:
the protection of the mountain ecosystem'

Franco Pedrotti

I will limit myself to reading the points we have discussed this morning during the workshops about the mountain ecosystem. Here are the observations which emerged:

Point one concerns our maintaining a strong awareness of the unity of the mountain ecosystem. Hence, management policies should be made in accordance with the definition of protected areas, in order to avoid episodes like that of the Stelvio, through a wider protection of forest ecosystems in mountain areas.

Point two: productive activities in the mountains should not be discouraged. This also includes sporting and recreational activity, with the exception of the more extreme ones, such as the establishment of new tourist centres and skiing resorts.

Point four: we need to favour any possible reconstruction of small alpine rural properties, even in new ways, like the farmstead [maso chiuso]. This does not apply of course to the areas where it has traditionally been used, such as Alto Adige, for instance.

Point four: this kind of development has to take the issue of the recovery of anthropic environmental goods, such as rural houses, into account.

Point five: the vast problems of infrastructures, viability, parking and railways, have to be dealt with by paying particular attention to the fragility of the mountain environement.

Point six: we need to favour the recovery of coppice and degraded forests in Apennine parks and in the whole Apennine chain, by replacing them, where possible, with high-trunk trees. We need to avoid impromptu policies and to re-launch a plan for the balanced utilization of forest resources outside parks, thus reducing our import of wood and the deforestation of countries we are importing wood from, which often exercise few controls.

Point seven: from the point of view of the European Union, we need to extend the protectionof mountain environments to the new countries of the EU – we here have eastern Europe in mind.

Point eight: as for tourism, we ought to avoid opening new tourist areas destined to fail within a

short period of time, and to favour instead the various agricultural, pastoral and artisan businesses.

Final point: we need to favour an environmentalist education in all schools, academies, universities, local associations and institutions, in order to increase the awareness of mountain environments among the younger generations. A crucial role is here played by the media, and particularly by television, as by specific associations such as the European Academy of Bozen, or the Centre for Alpine Ecology of Mount Bondone, and other centres we will identify. It is a complex matter.

PRESIDENT ABRAMI'S CONCLUSIONS: PRIORITIES OF THE IAES AND READING OF THE INTERNATIONAL CHARTER FOR THE STUDY AND PROTECTION OF ECOSYSTEMS

PRESIDENT ABRAMI'S CONCLUSIONS: PRIORITIES OF THE IAES

Prof. Pedrotti showed his usual amiability and scientific expertise, which we had no need to discover in this in this conference, but we once again appreciated.
As I personally told you, yours was a contribution of great clarity, particularly when you pointed to the death of ecosystems and to the effects of certain substances. I would personally like to thank you and the workshop.
Once more, I would like to thank you all for your patience. We are almost done.
First we will mention our priorities; then, we shall read out a moving and most interesting document Perez Esquivel wrote, about these days, our prospects and the Academy.

What follows, are the conclusions our conference has reached after these days of debate and common work: no doubt, we have several means of work and intervention to choose from.

◆ Citizens' right to information

Let me start by mentioning priority n.1, which is related to a fundamental right: citizens' right to information. Before acting, citizens have to be informed, not merely from a juridical point of view – let me assure you that even those working in the field often are not – but also from a scientific point of view in particular. What does this mean? It means providing a simple but complete information, and easily accessible but effective information. This is not an easy task: it is far easier to talk with those working in the field in technical terms. It will require a lot of work, for we will have to identify all the environmental conventions and treatises of the various countries; what has been ratified and what has not; what has been ratified, but not implemented; what has been ratified, but only partially implemented. We need to provide access to environmental information, then. Yet, this alone is not enough: we also need to provide access to the decision-making process.
Our chart contains passages we have long discussed, on what to do. As Giovanni Damiani, who long directed the ANPA, knows well, citizens' participation is often a flatus vocis; the VIA institute and the regulation now in force do not guarantee this fundamental right: citizens are not seriously interacting or taking part in the decision-making process.

No doubt, we have enforce this right through a new philosophy based on the idea of "building without destroying", and of "planning without contending"; we have to study means of association to guarantee the participation of all subjects to the decision-making process, first of those most affected by environmental decisions, and then of all the others (citizens who are not living in the affected areas, etc.). We need to provide all with effective means. The Canadian public poll, for instance, and other such cases can provide us with a first incentive. We will later come to discuss this.

The first point the Academy identified as absolutely crucial for its development, is citizens' access to environmental information and participation in the decision-making process.
I am well aware of the fact that we chose a difficult path, but I believe it is a matter of civility. As Adolfo Perez Esquivel mentioned, lying to a child creates violence: providing misleading informa-

tion can create environmental violence, not because we are children – although in a way we are, since we are so greedy at times – but because we need to be informed.

❖Sustainable development: the compatibility of development with the reproducibility of the resources.
We have talked a lot about this issue of sustainable development, which is closely linked to the issue of the depletion of resources. Much more will be said.
Our chart starts by defining the concept of environment. I will later read the chart, before Prof. Esquivel's final declaration, for I believe it is worth mentioning certain points about sustainable development from the point of view of the relation of man to the environment. I am here thinking of what Marino Folin mentioned the other day. Dr. Folin was patient enough to wait until the end to deliver his wonderful paper, which he ran off in a heartfelt and cultured way.
Our solutions have to serve the urban ecosystem. We have discussed the possibility of lowering housing and transport density. We have been discussing the quality of life for years. If we are to avoid merely employing these greatly abused terms, we have to provide them with a content. A remodelling of the urban ecosystem provides a content for sustainable development. We have provocatively used the expression 'urban ecosystem', because it is the product of the relation of man to his environment. Were we to stick to what the botanist Tansley said – it is you, Pedrotti, who taught me this – we would stop at a merely naturalistic idea; if we then read the term 'functioning unity' in the law, 60 years later, without understanding a thing, we will have to discuss the situation.

◆ Support of southern countries in the development and implementation of appropriate environmental policies: the issue of povery and lack of water.
With my usual straightforwardness, I have accepted this funding of 70 million Euros as a positive choice, for water is a fundamental resource. No doubt, we might recall Parini's description of polluted air and stinking waters in the latter half of the XVIII century: "he who first exposed the sad and idle waters of my town and held its health in contempt for his own profit". This is still the case in the stinking cities in many areas of the world. A first attempt to deal with the international nature of pollution leads us to an establishment of appropriate environmental policies.

☒ The close connection of the repudiation of war with environmental protection.
We are not keen of pointing this out only because we are proud and glad to have Perez Esquivel, winner of the Nobel prize for peace, among us.
Repudiating war means thinking in positive and different terms, for us. It means providing positive contributions and hope, and thinking about work and a different relation of man with the environment.
When we are talking about "repudiation of war and promotion of peace among peoples," we are not only referring to States, at least not directly. The idea mainly refers to the relation among peoples, because if they start to march together, to communicate, the State, which is an expression of the people, must take this into account; at least, this should affect its policies.
But why are we talking about war? Why should this guarantee environmental protection and development? Obviously, Saddam comes to mind here, since we all have the image I mentioned to Adolfo Perez Esquivel in mind: that of the cormorant among the oil wells. We should of course discuss the kind of warfare, but no doubt the environment was struck, then as in many other occasions when bombs and chemical products caused environmental disasters with terrible effects on health.
All we can do, as a small cultural association, is to give a simple but heartfelt suggestion: the envi-

ronment ought to be closely linked to peace in political terms, because peace-fostering politics cherishes respect for traditions, diversity among peoples, and the conservation of natural resources.

⍁ Establishment of the INTERNATIONAL CRIMINAL COURT FOR THE ENVIRONMENT.
Our fifth priority stems from the fourth. It consists in the need internationally to protect the ecosystems from any attack, bearing the need for interdisciplinary, international studies in mind, through the establishment of an INTERNATIONAL CRIMINAL COURT FOR THE ENVIRONMENT.
We feel the need to deal with issue of the establishment of this International Court. We will do our best to approve the change of the present charter of the International Court. We are not dealing with huge projects, but it is a difficult task, which we cannot, Adolfo, abandon.

⌘ The promotion of education about the knowledge and protection of resources: from local political institutions, to regional, national and international ones.

{The promotion of environmental education in all schools, academies, universities, local associations and institutions, to raise the level of environmental awareness of the new generations.

❁ As for cultural and artistic aspects, the Academy aims to:
promote the idea of art as an expression of a striving towards a world where the environment is respected among the young;
to stimulate critical thinking on the consequences of a lack of its valorisation.

The links between culture, art and the environment are an important means to raise awareness among the young and civil society at large.

With this in mind, the Academy aims at enriching professional training craftsmanship with informative and educational elements stressing its artistic and cultural roots and illustrating artistic evolution over time. A contest at the end of these courses might help the more worthy pupils.
Thank you for your patience. Our charter is now available, but before, Adolfo Perez Esquivel will be reading his declaration.

A READING OF PROF. ESQUIVEL'S MESSAGE

Marcelo Enrique Conti

I would first like to say that I am honoured to be given the chance to read this important letter by Adolfo. I have often been called upon in these days to translate his words. I must confess I have often found this hard, and have told Prof. Esquivel: 'Look, Adolfo, to translate your sentences we'd need the words of a poet.' I will now read you the letter.
'Protecting the environment before it's too late is a crucial and urgent matter. Humanity needs to get back to the earth and what it stores – the sea, living creatures and man, who is responsible for both the life and death of the planet – with all its heart. We shall reap tomorrow what we sow today – there is no other path.
The International Academy of Environmental Sciences is trying to re-establish collective consciousness, environmental research and development, by promoting prevention and security policies, such as the scientific and juridical evaluations required to reach the necessary balance for our peo-

ples and the world. We – scientists, educators, politicians, social organizers, trade unions, the Church – are all responsible for the salvation and protection of our mother earth and for proclaiming that a different world is possible. Adolfo Perez Esquivel.'

Parting and closure of the conference

Antonino Abrami

I would like to thank you and end with the first sentence of our Charter, which reflects Esquivel's message: 'Respect for Mother Earth requires each man to be a custodian of the earth.' Thank you.

Venice 29 December 2003

The Vice-President
Prof. Giuseppe Cartei

The Acting President
Prof. Antonino Abrami

ATTACHMENT I
Enclosure "A" to n. 150017 of repertoire and to n. 9263 of collection

ARTICLE 1 - NAME AND LOGO.
The "INTERNATIONAL ACADEMY OF ENVIRONMENTAL SCIENCES" (henceforth called the Academy), with its head office in Venice, Villa Herriot, Sestiere Guidecca 54L [now in Venice, " ex Convento dei Servi di Maria", Campo della Chiesa 3 , S. Elena 30100], is an international scientific association founded by a group of scientists of different nationalities and distinguished experts in different disciplines (henceforth called the founding members) with the aim of pursuing the objectives listed in the following Article without commercial gain.
The Academy can set up other offices.
The offices in Rome (Italy) and in Bruxelles (Belgium) have already been established.
The Academy's logo represents a woman and a man in the foreground and, in the background, the earth's globe and around the circular border the words "INTERNATIONAL ACADEMY OF ENVIRONMENTAL SCIENCES". The logo is shown below:

ARTICLE 2 - AIMS
The object of the Academy is to promote the development of mankind and the environment in harmony.
The individual aims of the Academy are:

1. To identify, support and promote excellence in scientific research on the environment by scientists of all nationalities and to encourage research and development on environmental matters.
2. To promote contacts and relationships between researchers and develop all manner of teaching and study, using all available means to disseminate and transmit data and policies relating to the juridical and scientific aspects of the environment, and developing communications among the international scientific community and interested parties.
3. To promote the publishing of material relating to environmental science and technology and the latest developments in the field.
4. To promote projects, research programs and experimental projects, including theoretical research, and the practical activities required to analyse and monitor the environment.
5. To achieve effective protection and sustainable development of the environment in co-operation with institutions, organizations or groups on a local, regional, national or international basis pursuing similar aims or one of them.
6. To promote a broad educational program at every level with a view to increasing the information available on environmental problems.
7. To promote initiatives urging the support of State organs responsible for all kinds of agreement, directive, rule, national or international treaty relating to the protection of the environment.
8. To promote initiatives fostering the protection of human rights.
9. To promote initiatives supporting the creation of an international Court for the environment.
10. To promote initiatives supporting the creation of a permanent Centre for environmental studies.
11. To promote and support initiatives – firstly at a local and regional level and then at a national and international level – which will reinforce the protection of environmental resources.
12. To promote initiatives that will assist and encourage the new EU members to respect the Community rules for environmental protection.
13. To promote the study, recovery, preservation and value of the historical and artistic heritage of

Venice, as well as the world's natural, historical and artistic heritage.
14. To promote the study, recovery, preservation and value of the Venetian ecosystem as a laboratory and an important juridical and scientific resource for environmental research and study.

Article 3 – THE MEMBERS
The members of the Academy are grouped in the following categories:
1. Founding members:
   Those persons who assisted in drafting the Memorandum of Association of the Academy or who confirmed their acceptance of the Statute even if only by "e-mail" or fax.
   The title of founding member may be given to those who, called upon by the President or Vice-President for a particular reason, have declared that they accept the Statute of the Academy.
2. Ordinary members:
   These are the scientists of any nationality who have gained the highest respect of the international scientific community and who, after accepting the Statute of the Academy, may be elected according to the procedure explained in the following Article 4.
3. Honorary members:
   These are eminent persons who have made high quality contributions to the objectives of the Academy.
   They are elected by the Executive Council by a unanimous vote and by a majority of at least three-fifths of the members.

Lapse of membership.
The title of member of the Academy will lapse after death, resignation or exclusion.
The Executive Council has the right to exclude a member on sufficient grounds.
Sufficient grounds for exclusion include the following:
- Failure to comply with the Statute
- Conflict of interest between the member's responsibilities and other duties performed;
- Acting in a manner contrary to the purposes and aims pursued by the Academy

The excluded member may appeal against the exclusion in writing, giving his/her reasons up to 30 days from notification of the decision to exclude.
If the Executive Council rejects the appeal, the excluded member can make a further appeal at the next meeting of members, which will make a final decision on the matter.

Article 4 – ELECTION OF MEMBERS
The procedure for the election of members is as follows:
To apply for admission as a member of the Academy the candidate must be proposed by at least one member and must complete an application form signed by the member, who also encloses any necessary or appropriate information about him or her.
The application form is addressed to the Executive Council.
The Council submits the application with the information and its comments to the appropriate membership assessment committee, which then arranges for a judicial inquiry and delivers its opinion to the Executive Council.
The Executive Council, after receiving assurance that the candidate will observe the Statute of the Academy after their election, votes on the admission by a secret ballot of at least two-thirds of the members.
If the result of the vote is positive, the Council informs the existing members accordingly, inviting them to express their opinion within 15 days by post or e-mail.

The final decision whether the candidate is accepted or rejected, after taking into consideration any observations by members, is submitted to the President, whose decision is irrevocable.

Article 5 – THE ORGANS OF THE ACADEMY
The following are the Organs of the Academy:
- the Members' Meeting
- the Executive Council
- the President
- the Treasurer
- the Secretary General

Article 6 – GENERAL MEETING
The General Meeting must be held at least once a year to approve the budget, and whenever the Executive Council deems necessary, or if at least one-quarter of the members requests such a Meeting.
At least half of the members plus one must be present for the General Meeting to be valid.
Resolutions are carried by a majority of votes except in particular cases provided for in the Statute.
Each member must be given at least ten days' notice of the General Meeting and the call notice must be accompanied by a copy of the agenda and details of the time and place where it is to be held.

Article 7 – THE EXECUTIVE COUNCIL
The administration of the Academy is entrusted to the Executive Council, made up of a minimum of 5 (five) and a maximum of 11 (eleven) members nominated by the Meeting from candidates appointed by a Committee of Members.
The Meeting will establish, on each occasion, the number of members of Council.
The Executive Council will include the President, three Vice-Presidents (one of whom will be appointed Acting President), a Treasurer and two ordinary members.
The first Executive Council will be appointed according to the above-mentioned nominations by the Memorandum of Association of the Academy, and two ordinary members will then be appointed according to the procedure for the election of members described in Article 4 above.
The members of the Executive Council will be appointed for a period of 5 (five) years and will be eligible for re-election.
The Executive Council will arrange to cover any vacant position caused by the death, resignation or incapacity of one of its members for the remaining period until the next Meeting.
The Executive Council may set up temporary or permanent committees covering any necessary functions which may occur. The Committee whose responsibility it is to appoint the members of the Executive Council and the membership applications Committee are nominated by the Assembly.
The Council will establish the policy governing publications by the Academy and will appoint an editor in charge.
The Council may award medals and other prizes to researchers and scientists who are considered worthy by committees of experts.
The Executive Council will meet at least once a year; if the Executive Council considers it necessary, it may avail itself of the Scientific Committee mentioned below in Article 11.

ARTICLE 8 – THE PRESIDENT
The President presides over the General and Executive Council meetings and outlines the

Academy's activities at these meetings.
In his absence, the President is represented by the Acting President or the Vice-Presidents.
The President and any Acting President empowered as Vice-President shall, severally, legally represent the Academy.

ARTICLE 9 – THE TREASURER
The Treasurer is responsible for the Academy's finances in accordance with the Council's directives, and takes account of specific agreements made with other organisations and institutions.
The Treasurer presents the statement of account to the Council on a yearly basis and whenever the Council deems it necessary.
The Treasurer prepares and presents the annual financial statements and the audited accounts to the Council and at the General Meeting.
The Treasurer, who is authorized to delegate his/her duties, is appointed by the Executive Council.

ARTICLE 10 – THE SECRETARY GENERAL
The Secretary General, appointed by the Executive Council, is elected for three years and will be eligible for re-election. The Council is entitled if necessary to dismiss the Secretary General from office.
The Secretary General directs the Academy's staff. He is responsible for administering the office and relations with public and private institutions, in particular with EU institutions and regions. Such institutional relations shall be governed by guidelines and/or directives approved by the Council or, if so delegated by the Council, by the President or Vice-President.
The Secretary General takes part in Executive Council meetings with an advisory vote.

ARTICLE 11 – THE SCIENTIFIC COMMITTEE
The Scientific Committee is composed of eminent scientists and persons who have distinguished themselves by acts of unquestionable cultural and social value for the study, enhancement and protection of the Environment.
Regulations governing its formation and operations will be issued by the Council.

ARTICLE 12 – ACADEMY RESOURCES
The Academy is authorized to accept, for purposes connected with its organisational objectives, financial support from any source, be it a national, international, public, private, governmental or non governmental body or an individual. It may accept payments and reimbursements for services rendered. Such funds shall be accepted by the Council.

ARTICLE 13 – ADMINISTRATIVE CONTROL
The Academy's financial statements will be suitably checked (audited?) according to agreements made with the organizations that have provided financial assistance to the Academy.

ARTICLE 14 - ADDITIONAL RULES
The Council may adopt such regulations as prove to aid compliance with the rules of the Statute.

ARTICLE 15 - MODIFICATIONS TO THE STATUTE
Modifications to the Statute are made by the General Meeting by a vote of at least two-thirds of the voting members present.

ARTICLE 16 – PROVISIONAL MEASURES

The Council may legitimately and validly issue deeds and operate with members appointed at the time of establishment, while awaiting formal appointment of two ordinary members, in pursuance of Art. 7 and in accordance with the procedure described in Art. 4 herewith.

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