

SERIES VALUES, EDUCATION, CULTURE

# Social Monitoring of scientific production system

PROPOSAL PAPERS FOR THE XXI<sup>ST</sup> CENTURY - CHARLES LEOPOLD MAYER EDITIONS

# Proposal booklets for the 21<sup>th</sup> century

*The proposal booklets are a collection of short books on each decisive area of our future, which assemble those proposals that appear the most capable of bringing about the changes and transformations needed for the construction of a more just and sustainable 20<sup>th</sup> century. They aim to inspire debate over these issues at both local and global levels.*

The term 'globalisation' corresponds to major transformations that represent both opportunities for progress and risks of aggravating social disparities and ecological imbalances. It is important that those with political and economic power do not alone have control over these transformations as, trapped within their own short-term logic, they can only lead us to a permanent global crisis, all too apparent since the September 11<sup>th</sup> attacks on the United States.

This is why the Alliance for a Responsible, Plural and United World (see appendix) initiated, in 2000-2001, a process of assembling and pinpointing proposals from different movements and organisations, different actors in society and regions around the world. This process began with electronic forums, followed by a series of international workshops and meetings, and resulted in some sixty proposal texts, presented at the World Citizen Assembly held in Lille (France) in December 2001.

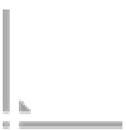
These texts, some of which have been completed and updated, are now in the process of being published by a network of associative and institutional publishers in 6 languages (English, Spanish, Portuguese, French, Arabic and Chinese) in 7 countries (Peru, Brazil, Zimbabwe, France, Lebanon, India, China). These publishers work together in order to adapt the texts to their different cultural and geopolitical contexts. The aim is that the proposal booklets stimulate the largest possible debate in each of these regions of the world and that they reach their target publics whether they be decision-makers, journalists, young people or social movements.

# **Presentation of the Paper « Social Monitoring of scientific production system »**

"Scientists cannot be satisfied with producing knowledge and applications. They must also evaluate the impacts of their findings and accept responsibility for their possible uses". (Alain Ruellan, May 2000).

On the basis of this observation, the team of the "Social control of sciences" workshop of the Alliance for a responsible, plural and united world reflected on the role of the scientific community vis-à-vis ethical, social, cultural, economic and health problems.

This document summarises the group's debates and the proposals resulting from them. Their considerations end with a list of basic questions and examples of projects underway and actions to be organised.



# **Social Monitoring of scientific production system**

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# Introduction

## General objectives of science

### Liberty of scientific research

1) Science has the objective of increasing the knowledge of mankind. For this, it must be free from deleterious choices imposed by the production system, i.e. by the governments and the economy. It is the production system that must be controlled. The freedom of research must enable a renewed interest in the study of laws that govern the universe rather than trying to transform it according to the objectives of a particular group.

### Essential values

2) Scientific research and the use of scientific knowledge must allow a holistic approach of the world. This approach supposes that, following the example of what happens in most of the societies living on the planet Earth, the collective being prevails over the individual interest. Thus, the joint respect for the plants, animals, the present and future generations of humanity, and for the ecosystem, must accompany any research of scientific knowledge, and with all the more reason, its applications.

### Complementarity of liberty and values

3) Liberty always evolves in an ethical and moral framework which gives it its form. Without this structure, man's life and scientific research itself would sink into chaos and barbarity. That is why liberty and values form an inseparable couple of all scientific activity and must be defended as such.

## Defining the objectives of the production system

4) The implementation of knowledge through technology has an impact on society. Thus, the funds allocated for applied research by the governments and the international and supranational organisations serve political objectives. As for the researches financed by the private companies, they serve economic objectives. From then on, it is advisable that these economic and political objectives be decided in accordance with the civil society. In other words, these economic and political objectives must correspond to the expectations of the populations and the application of the ethical, moral and judicial rules. Thus, a new relation between applied sciences and the society is imperative to resolve the world problems.

5) A certain number of criteria enable the general definition of the objectives of the production system. (This is not an exhaustive list).

### Endogenous development

6) The endogenous development is the form of development which must be in accordance with the natural, social and cultural aspect of each country, with all the local characteristics, and being respectful of them. To picture the endogenous development, the development of an apple tree does not have to

end in a sequoia, but in giving apples. This development is not based on the import or copy of technologies; it is not a conformity to an external model that establishes the criteria of development according to an economic scale of measurement. The endogenous development is the only one that corresponds to the common good, and still it is one of the objectives of the production system.

#### Struggle against the inequalities and misery

7) The debate is evidently dominated by the question of knowing what happens if the whole world adopts the western countries' lifestyle. Having said that, the production system must enable the balanced distribution of the natural resources. Also, the consumption level must try to equalize. Regarding this last point it is advisable to note that poverty is not misery. If a simple life and high thoughts characterize poverty, misery is characterized by an absolute indigence, the end and loss of social, cultural and religious boundaries. The distinction between poverty and misery is fundamental: it is not advisable to struggle against poverty by a poor-people hunt forcing them to either integrate into the middle classes or ... to become miserable people; but it is advisable to struggle against misery that stretches everywhere in the world, which is very different. Simple life and high ideas, it is the privilege of poverty, and it is a laudable objective and characteristic of an honest life. This being indicated, it is advisable to affirm that the struggle against the inequalities is an objective of the production system.

#### Ecology and sustainable development

8) The production system must orient itself towards an optimum waste management by recycling, a respectful management of renewable resources and of biodiversity. In one word, it is about conciliating economic and scientific growth. In order to do this, the precautionary principle must be applied systematically.

#### Elegance of technological choices

9) The technological choices must be expressed by the most simple and elegant choices. The most beautiful solution is always the one that is the simplest, and that is why this aesthetic requirement always commands to emphasize the prevention of diseases, for example, rather than the costly therapies that come into play once the disease is announced. Generally, the technological choices contribute directly to the ambience and to lifestyles of societies. The orientation of the production system supposes not to forget that the choices shape the conditions of daily life.

#### Health

10) The production system must enable the struggle against insecurity of provision of food and water, and against insufficient public health care.

#### Duty to inform

11) Free flow of information related to all possible uses and consequences of new discoveries and technologies must be ensured in order that their ethical dimensions be discussed accordingly.

## Values and rules for being protected by the scientific community

### Values

12) The constitution of a scientific community free from the production system supposes that this community fits in with common values. To explain that, it is easy to see that, from a simple functional point of view, liberty can only exist in keeping with a value system. Only these values could cement a community, as the need of deontology codes or ethical charters, for example, shows it.

13) To this pre-occupation of sharing some common values, illustrated by the deontological and ethical charters which have seen the light of day in several research centres, this present text has the vocation of adding a conscience clause and a solemn oath.

### Rules

14) This text does not have the vocation of being an ethical charter. Nevertheless, a certain number of essential points must be emphasized.

- a) The existence of an organized scientific community is a necessity, and this specially in many countries of the South where this community must still be created.
- b) The interests of science must be subordinate at all times to the respect of human dignity, to comprehension and compassion for all living beings, rather than making use of others and of the living world for the sole benefit of the material interests of people, firms or states. Societies have the right, once a democratic debate has taken place, to ban certain forms of research deemed contrary to ethics and which, when applied, directly or indirectly, may undermine human integrity and dignity.
- c) Considering the previous point, it is also advisable to create a valid equivalence of rights and ethics for all the countries in such a way that the applied researches morally reprehensible, or the fundamental research using morally reprehensible means, could not be bypassed by delocalization. The same ethical rules must be applied in all the countries.
- d) The deontological codes governing scientific research, and especially in the use of traditional knowledge still free from the intellectual property rights, must be developed in order to stop the pirating of this knowledge.
- e) The rule of law is an essential condition for justice to function properly. Therefore, it is one of the basis for the application of the proposals made in this proposal specifications.

15) These few recommendations could not possibly constitute an ethical charter worthy of this name. The initiative already taken by the scientists on the ethical plane must be taken into account.

Production system monitoring

16) The production system monitoring by the scientists and the civil society can be carried out in two ways:

- a) maintain scientific research free in order to prevent it from being instrumentalized by the production system;
- b) democratize the production system.

# Proposals

## Liberating scientific research from production system

17) As it was said above, science must be free from deleterious choices imposed by the production system, that is to say by governments and economy. What must be controlled is the production system. That is why the scientists (like each and every employee) could and must organize themselves to avoid being enlisted in projects that would go against their values. Likewise, they could and must avoid supporting these very choices. Their freedom thus found will enable a renewed interest in the study of laws that govern the universe, rather than trying to transform it according to the objectives of a particular group. This way, they could and must find their essential function.

18) The combination of two elements must liberate research: a *conscience clause* enabling a scientist to distance himself from those who want to force him into suspicious dealings, a *solemn oath* pronounced at the end of the studies ensuring the identity of the professional community centred around essential values.

### Conscience clause

#### Presentation of the conscience clause

19) As the scientists are in the best position to record the often dramatic consequences of the misuses in the companies (private and public) for which they work, it is natural that a conscience clause protects them if they bring to open the continuous and deliberate actions that are registered in violation of the precautionary principle, public health, environment, deontology in scientific research and technological production. This conscience clause is besides a breakthrough of the Society of Scientists and documented in the specifications of the breakthroughs as being the object of an international agreement at the International Labour Organization (ILO). The chances of ending up in ILO are good because the trade unions of employees as well as that of employers are represented there. If the ILO does not consider our text, one of its trade union's member can oblige it to launch a study procedure.

20) Whatever it may be, this international agreement must be "self-executing", that is to say, it must be possible to invoke it directly by the concerned private individuals without any other national formality. Moreover, the ONGs must have the faculty to go to court, either civil or penal, to assert the value of the rights thus accorded and assist the private individuals who have the courage to make their conscience prevail. This agreement has the only objective to create and insert a "conscience clause" in the national labour law, giving right to the salaried employees, especially scientists, to refuse to participate in "dangerous" works (defined below) and to denounce it if necessary. It must come to light that the employer will be threatened with penal and civil punishments if he tries to intimidate his employee. Logical consequence of the freedom of research is that the conscience clause tends to liberate the scientists from the abusive hold of their employers.

21) In order that the conscience clause functions, a scientist's charter, a professional code of ethics become necessary, ruled by an independent organism. It is very important that the conscience clause be validly invoked. It can only be invoked in keeping with the ethical stakes based on deontology.

22) It is also important that the researchers have knowledge of the purpose of the applied research on which they are working. A research can be divided into sub-programs, and having only partial information, the researcher may be in situation to work while being unaware of the true purpose of the research. Therefore, for the researchers to be able to put forward the conscience clause, he is in need of an information on the overall objective of research. It is therefore advisable to demand the transparency of the research subjects.

23) It is advisable to indicate that the conscience clause is not aimed at giving a monopoly to the scientists. That is to say, in the subject of applied science, we must not allow the scientists alone to decide what is good and what is bad.

24) There is a general preoccupying problem of democratic legitimacy in most of the developing countries and in certain developed countries, which poses the question of applicability and implementation of a conscience clause. Thus, given the problem of disrespect of the existing laws in the developing countries and in developed ones, it is advisable to see that the effective implementation of the conscience clause therefore demands the maintenance, or even the re-establishment of the rule of law in countries where it would have disappeared.

25) In brief, if we expect the transparency from the scientists, we have to protect them by the laws. The funding agencies and the government could put knowledge to bad use. The fact that the scientist could rise up against that is a good thing.

Draft text proposed for the World Assembly in Lille

26) *Faculty* is granted to any collaborator of any company to inform the concerned authorities in the country of head office of the enterprise, of any activity carried out continuously and wilfully in violation of the :

- Precautionary principle;
- Public health;
- Environment;
- Professional code of ethics for scientific research and technological production.

27) *Confidentiality*: the authorities contacted guarantee the confidentiality of the information received and the anonymity of the informer. Any damage sustained by the informer on account of his initiative must be compensated for, legally by the company or administratively by the government, if the information given actually constitutes a violation of the above mentioned stipulations.

28) *Extension of the prosecutions*: the offending company must be prosecuted by the government as soon as the file submitted by the informer is sound. Likewise, any organ of the society in knowledge of these continued and serious misappropriations must be prosecuted individually.

### Strategy of implementation

29) Any interested natural person or legal entity, particularly active in the scientific domain in one form or the other, could extend their support and provide information on the legislation of their own country regarding the conscience clause (Web site with the information : <http://www.apsab.span.ch/clc>). An active campaign for lobbying will be organized with the concerned parties, including the scientific press, latest by March 2002, in principle, in view of the general assembly of the ILO in June 2002.

### **Solemn oath**

30) The training of scientists requires that deontological, moral and ethical aspects are taken into account. Apart from the acknowledgement of the technical aptitudes of the students in science, conferring a degree must be accompanied by a solemn oath like the Hippocratic oath for the doctors. The scientists' degree contains a technical part but it must contain a more moral part which must include the consciousness of a common destiny. Generally, all the disciplines must include an oath at the end of the studies, before the students enter the professional life. This text must especially refer to a cultural tradition. A commitment (still to be written) taken for the future generations, with the promise of putting all the experience of the previous generations at the disposal of future preoccupations, will have the desired solemnity.

31) This oath will especially adopt the criteria subjected to the conscience clause. From then on, the employers will be previously informed of the ethical, moral and deontological criteria taken over from the judicial plane that the scientists whom they engage are equipped with. All this will confer a preventive aspect to the conscience clause (it will take effect even before an effective denunciation).

32) The identity is also defined by common values. A socioprofessional community could gain in integrity and cohesion as soon as it could be fitted into a text expressing values and into a history. A pledge of loyalty to its common values taken out of respect for the experience of the scientists of past generations is already a way of saying that the researchers of today were not auto-products, but that they have an origin. To maintain this loyalty, the form of the oath must evolve so that the scientists do not become victims of organisms carrying antiquated ideologies, nor of simple avidity. Putting history, values and responsibility towards the present and future generations into perspective is essential to the reinforcement of responsibility of this professional community vis-à-vis the society.

33) A scientist first of all works for the benefit of his domain of studies and entirely dedicates himself to his task. Ideally, a scientist is more interested in his research than his salary (at least that's what happens in the good universities). Moreover, the scientists are worried about the common good insofar as they are also citizens.

### 34) Proposal

a) There is already a obligation in some universities to take an oath. It is advisable to collate these texts, in order to make a synthesis and extract from them the best they can offer, in order to encourage later the different

universities and specialized schools to develop this type of oath, and especially update them as and when the applied science develops. Of course, this oath must be thought in conjunction with the imperatives of the conscience clause.

## **Clarification of the different roles and functions of the scientists**

### Problem

35) It is advisable to note that distinguishing science from production system demands a clarification of the roles assumed by the scientists within the society. It is not possible to accept that a scientist, a university professor paid by the society for full-time, also be the advisor of a big private company, and heads many expert committee mandated by the government. In other words, a scientific cannot at the same time be the representative of the academic liberty at the university, the representative of one of the poles of the production system for a private company, and the representative of the other pole of the production system (regulatory) for the government. The roles must be clarified quickly, without which the liberty of science will strictly not have any more meaning.

### Difficulty

36) We must notice that the expertise done for different entities by the teachers is a source of wealth for the students. The field experience of persons who have different functions is for this reason irreplaceable and there is no question that the universities sacrifice such experiences. Thus, this clarification of the roles must be done in such a way that the teachers who have different functions could continue to work in the university.

### 37) Proposal

a) It must be relatively easy to find a remedy for this situation through the rules the universities adopt for determining the titles of the teaching staff (professor, assistant professor, etc). The university must not oppose to such a revision at middle term, because this measure has the objective of preserving its *raison d'être*, and academic liberty. Without entering into details, to avoid going too far, practically, it is enough that the nomenclature of the titles of teaching staff enables one to find oneself in the roles assumed by each one. For example, the title of professor can only be given to the teachers working for the academy alone, while the teachers working in a significant manner outside the academy must be designated as consultants. The purpose is simply to invent a nomenclature of titles and common rules, which will enable the identification of the representatives of the academy for what they are, and to distinguish them clearly from consultants who, the same time that they have a teaching responsibility, are also serving the production system. In brief, it seems relatively easy to ensure that the image of the academy stops being blurred in the public eye by the conflict of interests of experts who teach there.

# Democratization of the scientific production system

## General aspects of democratization

### What to democratize?

38) What has to be democratized is not science itself, but the production system. Effectively, the purpose of democratization is not to enter into the laboratory and tell the scientist what he has to do, but to control the purposes of the State and industry. The democratization is not intrusion into the purely scientific domain. On account of the skills it requires, one part of the scientific activity will escape democratization. Science as a whole is not included in the society. One part of science must remain outside the society, and must remain free and independent. The society does not have a complete and exhaustive right to control science. Science has the task of saying what is, to say what the things are, it has the essential task of describing the world. We must notice that even the principle of an independent expertise, necessary tool of any democracy, depends on the liberty that science has.

39) Having said that, if the free science makes positive things profitable to the society, it is insofar as it respects the deontological, ethical codes, and the essential values of this society. By its liberty to say things, to say it true, to understand nature, science actually nourishes the counter-powers that makes up the democracy. We must reinforce the institutional and financial means even more for the scientists to provide diagnostics on the state of air, soil, water, energy, the big bio-geochemical balance, etc. This type of work corresponds exactly to the scientists' mission, and from then on, the professional evaluation by the academy of the researchers who devote themselves to it, must benefit these researchers.

### Democratize first the society?

40) It is advisable to note that a great difference in sensibility and reality exists between the North and South on the question of democratization of the production system. The democratization of the scientific production system cannot be done without a democratization of the political, economical and financial structures. The democracy of the society on the whole must accompany that of the system of scientific production.

### The interdisciplinarity as a rule for decision making

41) A more conscious and open path, for the decision making, demands of the scientists that they develop a new network of relations. This network must be diversified in such a way that it includes for example the environmentalists, people of ethics, theologians, ecologists, the social actors, governmental agencies, NGOs and concerned members of the public. Generally, the decision making must be enlightened by the social science in order to restore the confidence between the scientists and the society. We are in need of social science such that the citizens understand what is happening. The scientists need to take the measure of the sociological dimension of the development of applied sciences. Especially, they have to acquire the capacity to face the ethical and moral dilemma during the decision making and their possible personal conflicts while conducting the project. This analysis suggests the idea of a new role for a

certain type of scientists, that of a mediator between the society and applied science. It might be possible that the necessity of a new "job" imposes itself, by which a "power", or a force of proposal, will be acknowledged.

## **The conference of consensus as a tool of democratization of the production system**

### Definition

42) The conference of consensus is a new concept. It is based on the meeting of a panel of about 15 to 20 citizens of different horizons, sexes, ages and cultures for several days to study a problem and make some recommendations to the government. The panel of citizens must be representative of the population so that the vote for the applications of science be credible. It is important that these citizens do not have any link with the pressure groups who have an interest in keeping with the case discussed. In fact, the objective of the conference of consensus is to reunite the "free" citizens who will be reflecting in all honesty, and not some representatives of pressure groups who play a game agreed upon in advance. Who have to invited are free people, who do not defend particular interests whatsoever. In fact, the principle of the conference of consensus is inspired by the Assize judgement which is at the basis of the administration of justice by the democratic states. Effectively, the Assize judgement brings together a popular jury representing the population.

### Sequence of events

43) At the beginning of the process the citizens will follow the lectures given by the experts who will present the necessary rudiments to discuss the case. There is no risk that the citizens decide without knowledge of cause about a scientific subject. These experts could be advocates, scientists or sociologists for example. This phase of information precedes the more contradictory discussion. Then the panel is put in a situation of expertise in the sense that their members would be giving a well-informed decision at the end of several days of discussions. They have a panel of experts at their disposal, from different fields and sometimes different opinions, and they could ask them the questions that they want. And they actually ask questions, since the decision to recommend any particular technological choice will be made by no other than them. The experts are also from different professional and institutional horizons and they present the subject by technical reports.

### Recommendations of the group

44) It is advisable to have an independent entity which chooses the panel of citizens and experts, otherwise the government could use these conferences of consensus and make them say what it wants. It is advisable to have some representatives of all domains: journalists, advocates, as well as scientific experts or simple citizens.

45) These conferences of consensus must be made public and moreover the debates must be mediatized.

### Efficiency acknowledged

46) It has been clearly shown that the grass-root citizens were capable of giving answers to the phenomena of the society. Such conferences took place in countries as diverse as USA, South Korea, Denmark, Switzerland, France or Israel, etc.

47) Regarding the future of the conferences of consensus, we must also insist on the fact that they can only exist and take full meaning in democratic countries.

48) In future, we must however pay attention to the harnessing of the conferences of consensus by different powers. The danger would be that these conferences of consensus will rather lead to the marketing studies being at the disposal of these powers. One of the diversions possible of the conferences of consensus would be that they serve to target the thresholds of acceptability for technologies, or for carrying out the commercial or strategic choices.

#### 49) Proposals

- a) We must request the UNO to organize world level conferences of consensus regarding the great developments and questions raised by the application of science. The first subjects dealt with could be genetically modified organisms (GMOs), water and energy.
- b) Generally conferences of consensus must be developed where a political choice concerning the orientation of applied research is necessary. It is therefore advisable to create one or several ONGs capable of satisfactorily organize them. In a certain way, it is not excluded that the conferences of consensus enable going towards a reduction of powers of certain despotic governments.
- c) The fate of the decision made at the end of the conference of consensus was not dealt with. However, it is a matter of working in future on the way of formally integrating, and with all the desired legitimacy, the decision of the conference of consensus into the democratic process. The legal status, and even the anchorage of the conference of consensus in the constitution of the different countries, is an aspect that we must evaluate in a prospective manner, because it is a means a possible renewal of democracy.

### **Science shop and community based research as tools of democratization of the production system**

#### Definition

50) The purpose of the science shops (which is part of what is called Community based research in the USA) is to establish a link between a community of inhabitants and the scientists, with the aim of finding a solution for a problem raised by this community. *[Note: the French equivalent of "science shop" must not be "boutique de science" (which has a commercial connotation), but "cabinet de science".]* The science shop is linked with this movement of thought which has tried to bring closer the universities and the population together especially through the worker universities of the beginning of the XXth century.

51) The community of inhabitants could make a scientific evaluation which would enable it to defend its rights. The purpose of these science shops is on the one hand to be able to evaluate at a good price the risks run (for example following water pollution). On the other hand, they also have the function of providing a possible counter-expertise for the official analyses or for those provided by the head of pollution. The science shops intervene in a very local context because its aim is to put a community into contact with for example a student capable of providing the required information. That is why the science

shops recruit some students who are doing for example their thesis work and it makes the academic demands coincide with a work of expertise earmarked for a "client". Of course the scientist could use these results for a publication. In doing this, the cost of the study is lower and could be paid by the community of inhabitants which, prior to that, must show that it could benefit a preferential price.

52) The Community based research of the United States functions a little differently but the overall objectives are the same.

53) Proposal

a) Wherever possible, the science shops could be developed as an interface between the universities and the populations. The Non Governmental Organisations as the already existing working universities could negotiate with the universities about the chance to take up this interface role with the population. On a case to case basis, the third party entities (like the local authorities, foundations, government student associations or university personnel) could contribute to the creation of this interface by stimulating and promoting the negotiation between the university and the Non Governmental Organizations.

## **Coexistence of science with traditional knowledge**

### Contribution of traditional knowledge to science and technology

54) Traditional and local knowledge systems, as dynamic expressions of perceiving and understanding the world, can make, and historically have made, a valuable contribution to science and technology, and there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge.

### Coexistence of different knowledge

55) By definition, the traditional knowledge is valid in keeping with a given reference frame. This is why science, à la western mode of discovery (even though it has drawn some of this knowledge from other sources), is not the only form of knowledge. There is traditional knowledge build up over years of experience in different cultures. This knowledge is generally considered weaker in rigour than western scientific knowledge especially as regards explaining cause and effect. On the other hand, the traditional knowledge is a carrier of a much need holistic vision of the world to take its complexity into account. Moreover, as is said in the preamble of this text, this holistic approach corresponds to the necessary values with which science and society have to compromise. Would it be possible to get western minds aware and trained to accept the mental constructs that explain phenomena in the traditional knowledge mode? The answer is simple: if science is one of the major sources of knowledge, it must also respect the diversity of representations in the world.

56) Proposals

a) The traditional knowledge is rich as a cultural heritage and as a breeding ground for empirical knowledge. This cultural heritage, this empirical knowledge, must be preserved, protected, promoted and studied.

b) We must acknowledge that this theme of coexistence has difficulty passing from the stage of declaration of the principle (proposal 1) to something more consistent. The traditional knowledge, in the best of cases, is only respected when it give assessable results in terms of experimental science. Besides, this is an example of colonialism of thought. Let us however note that western science of the XVIIth century was undoubtedly closer to the traditional knowledge that we had imagined. As an indication of this hypothesis, we only have to recall that a physician as Isaac Newton (known for his works on the law of gravity and especially the differential calculus) has - which is clearly lesser known - devoted the major part of his work to the study of metaphysical speculation. In other words, a closer reading of western scientists who considered that experimental sciences and speculative sciences have a common origin is called for and will enable going further in finding a veritable coexistence between traditional knowledge and science. There is still a big theoretical work to be done before progressing significantly on this question as regards responsibility.

## Education and media

### Education

57) Generally speaking, education is there to ensure a future in the world. However, the task of the scientists is not to educate the citizens. We must differentiate educating the scientists and educating the rest of the society.

#### Training the scientists

58) The scientists must be prepared to be responsible when they make decisions regarding the application of their discovery. That is why we must diversify the teaching resources, education on the human relations and the cultural base of the scientists. This must ensure the broadest cognitive basis for the decisional acts required for the orientation and the exploitation of applied research.

59) Enlarging scientific baggage means less favouring the moral or social sciences than awakening the consciences.

60) The dogma of the unlimited growth must be questioned. A means of reaching there is to ask that the university training in economics includes a course on the injuries inflicted on the biosphere equilibrium and the induction of disparities among mankind, which are difficult to accept and becoming more and more dangerous.

#### Training the population

61) Education is essential for changing the mentalities, so that the citizens understand the diversity of our environment as a whole, and for building the future. Education must serve to understand the cultural diversity, the sustainable development... And everyone must benefit from it.

62) The marginalized groups always require a particular attention. It is more than ever necessary to develop the acquisition of basic scientific knowledge, in all the cultures and all the sectors of the society, as well as the capacities of reasoning and the practical skills.

63) It is also a matter of sensitizing the populations to the ethical values in order to improve their participation in the decision making concerning the application of new knowledge.

64) We note what is lacking in today's education, that reinforces the sentiment that everyone thinks and reacts in the same way. We must promote the acquisition of a critical mind. Education must also reinforce the diversity of opinions and train people to be responsible.

#### 65) Proposals

- a) The university scientific training must develop a course (...) on the history of sciences, anthropology of knowledge, history of intellectual property, sociology of scientific institutions, research and development policy, the place of research in the production apparatus.
- b) Regarding the spreading of sciences, the governments must play a role to implement weeks of discussion for the scientists to explain their objectives.
- c) Finally, with the aim of orienting the scientific production apparatus, it is important for the population to have acquired a critical mind, have become aware of their responsibilities, and have taken a course on the ethical values and sustainable development. It is reasonable to think that the instituted groups (as it happens the teachers), in charge of this domain, continue to develop along the lines chalked out here as they have done till now.

## **The media**

### Review

66) The media, and especially the televisions and daily newspapers, play a big role in the social monitoring of the production system. It is through their channels that the public tries to get information about the great issues of the moment. Unfortunately, the mode of expression in the media is diametrically opposed to the demands of a scientific communication of quality. Thus, the media sources will put forward a scientific development only when it could be echoed with maximum sensationalism. The aim of the media is to sell, and sensational information is the one that sells best.

67) Communication, about discoveries of research as well as about orientations to be given to the scientific production system, demands on the contrary a lot of prudence and precision. Generally, the scientific progress announced will be echoed only very slowly and very unequally in the social fabric, and the problems that must be overcome to pass from discovery to innovation are always longer than expected. Finally, the promises thus made are often far from being kept completely, and they induce a certain number of perverse effects. The media ignore these difficulties only to retain the sensational aspect of discovery, which in turn induces an over-evaluation of real hopes and possibilities of innovation in the public's mind. This shows that information delivered nowadays by the media is not worthy of the essential issue, which is the formation of a public opinion well informed about applied scientific research.

### The scientists' role

68) If on the one hand the media are responsible for a certain scientific sensationalism, on the other hand the scientists, whose researches hit the headlines in the press, benefit from these consequences of media coverage, at least on a short term. To what point their responsibility could be invoked in this misinformation? The answer is not simple. In fact the answer is in three parts: 1) The scientists, because of the educational level that is their own, and also considering their knowledge of the subject they give to the media, are in a position of having the power to master one part of the factors that determine information. 2) To enable this information to be as accurate as possible, the scientists could evaluate with more precision the consequences of innovation and the difficulties that it entails to go from discovery to innovation. The social sciences often evoked by scientists to explain the consequences of innovations to the public will be of a big help in this function. 3) The stricter deontological rules could successfully guide the scientists in the negotiation that they set about to enter with the media on the modalities of spreading information.

### 69) Proposals

- a) It is advisable that in the media there be an equilibrium between mediatization and popularization. The actors of such a change are of course journalists, but also teachers, who are able to train a more demanding public vis-à-vis the media.
- b) Considering the status of the scientists, which is to give an account of reality, and the demand to tell the truth, two points that justify their liberty, a collective request starting from the very ranks of the scientists to limit oneself to the exactness of the facts during the presentation of their works must find a good echo within their professional community. This rigour in the communication of the facts does not end at the frontier of their discipline, but concerns the presentation of their works as a whole: the scientists must avoid spurring on unfounded hopes as far as the future use of their researches is concerned. That is why, in such matters, they must bring up only the facts established by the generalist scientist who alone can acquire an interdisciplinary vision of the real contribution of an innovation. For example: to describe the real contribution of genetically modified organisms (GMOs) in terms of food in the perspective of fighting against hunger in the world does not belong to the genetic engineers (specialists who were not trained for that), but to the generalists (agronomist-sociologist; geographer-moralist; economist-ethnologist, etc.). Of course, the generalists must work in independent teams of the production system, for obvious deontological reasons, which are avoiding the risks of conflicts of interest. As for the concrete consequences of research, the specialists could take the information given by the generalists who have the capacity to evaluate them. On the whole, this clear demarcation of the tasks carried out according to the real skills of one and all makes the scientists taken together to be the first beneficiaries of the extra credibility thus acquired in the art of establishing the facts collectively.
- c) The scientists have the responsibility with the other social groups to request the media to follow a certain number of deontological rules that enable to define the limits of sensationalism in the communication of the fruits of the researches.

## **Free movement of the researchers and brain-drain**

70) For the endogenous development to become a reality, first of all the "brain-drain" must be stopped.

71) Many countries fight to pursue their development in a certain autonomy. But many of their students, some of the most brilliant ones, emigrate towards the most developed countries. This only reinforces the economic, scientific, technological and ideological domination of the rich countries, and contributes to the scientific and technological colonialism which has become a reality in fact. Effectively the money involved in economic loss due to brain-drain often goes beyond the money invested in developmental aids.

### Deep causes of the problem

72) The primary cause of brain-drain obviously appears to find its root in the very resources of the countries that are victims of this exodus. From this point of view, it is only one of the multitude of consequences of disparities in the North-South relations: this problem of exodus of skills is linked to the world economic disorder: the local products and raw materials, which are the resources of the developing countries, are paid below the normal prices, and the aid for development does not compensate this inequality. Moreover the developing countries export raw products and import strong value added products. The remedies, at this level, would be: first of all to restore, or establish, an equitable exchange system, to pay the right price; but also, to encourage strong value added productions in the South, by denouncing the perversion of international aid when it forces to produce feeble value added products. It is advisable not to stop with this pessimistic statement, but to support the concrete proposals on this particular problem.

### Particular aspects of the problem

73) On the one hand, in the developing countries, the demographic growth is greater than in the industrialized countries. Primary education, simple schooling, are already big problems whose urgency prevails over the university needs.

74) On the other hand, the edification of technological and scientific structures, and in the very first place that of universities, is indispensable for the scientists to be trained in their own countries, and then be able to make here a career. Unless exceptionally, the developing countries do not succeed in constructing such an infrastructure. Apart from these universities and this infrastructure, we must give material independence to the scientists, and respect intellectual liberty.

75) Once the studies have finished, either in his own country or abroad, a scientist of a developing country finds only rarely in his country of origin the necessary conditions for the pursuit of his work and his research. There are no sufficient professional openings to enable him to put his knowledge to practical use.

76) Thus, those who can will try to work in the most industrialized countries. For example, in Microsoft, a high percentage of personnel are of Indian origin. (Let

us mention a social and cultural aspect of the question: in India for example, the girls dream of marrying the degree holders and go and live in the west.) Thus, the financial sums allocated by aid to the third world for the training of the young students are lost for their country of origin.

77) Another aspect of the question is that of compatibility of training with the endogenous development. It could be possible that the scientists trained in the developing countries find some work there, in spite of everything, but for some northern multinational corporations, with all the disadvantages that this implies. They will be then at the disposal of these multinationals who could pursue research programs without much hindrance that are contestable on the ethical plane, indeed dangerous for the host countries of such research programmes. Broadly speaking, unidirectional current of knowledge to the benefit of the multinationals will create a syndrome of dependence through a non endogenous development and therefore a reinforcement of the unequal situation. Moreover, the erosion of autonomy of traditional knowledge will only be more acute.

78) The question is therefore to know *which science* to develop in the South, to find, on the one hand, some openings for the scientists, and on the other hand to realize a veritable endogenous development.

#### Troubleshooting solutions

79) The endogenous development implies that the training offer for the scientists of the countries of the South must be dictated by the needs of the countries of the South. On the medical plane, the governments and the scientists of the entire world should ponder over the complex problems due to the bad state of health in certain populations. However, a system which claims to analyze the needs, and which plans the knowledge offer with respect to this analysis, is the typical expression of planned economies; it is not perhaps the best path for endogenous development. What place is left for the endogenous development as long as the evaluations and plans are made based on the dominant model?

#### Several basic rules allowing to limit the exodus of skills from the South to the North

##### **Training program**

80) The contents of the training, and this whatever be his field of specialization, must especially include a general course on the notion of endogenous development and the means of implementing it. This teaching must include case studies in very different countries of the world in such a way that the students also be in a position to launch their own project in accordance with the community.

##### **Training offer**

81) The UNO could promote the creation of research laboratories in developing countries, financially validate the function of researcher with the creation of a solidarity fund. The United Nations Fund for Research (for the post graduates) in the third world exists and it could be developed. The UNESCO has the capacity of promoting the training exchanges, as well as the one to reflect on the problem of professional openings that follows it. Generally, all the institutions working in this domain could contribute to enrich the training offer, at least upon the condition that they take into account some minimum rules that enable to check the unilateral exodus of skills.

### **Training contract**

- 82) It seems that a student getting a scholarship could be entered into a commitment by contract to put his knowledge at the disposal of his country, by working there a certain number of years following his training. This contract must be established on a voluntary basis in order to avoid contradiction with the free movement of the scientist, each having to be free to remain in a country, to leave it, or return to it. Generally, this contract must be based on a prior agreement on a minimum remuneration, and the assurance of a veritable professional opening.

### **Place of training**

- 83) Given the economic gap that exists between the South and the North, and the dreams that this gap has created, it is preferable, as much as possible, that the studies be conducted in the country of origin of the students from the South.

### **Cohesion between training and professional openings**

- 84) Having said that, we cannot ignore the fact that professional openings are necessary for these students, sufficiently interesting for them to feel like remaining there. However, the appropriateness of the branches of training proposed with the work offered supposes a planning that it is not simple to implement... as is shown by the failure of planned economies. In spite of the difficulties of the exercise, the training offer must be thought in terms of the needs and possibilities of future work..

### **Decentralized co-operation**

- 85) The notion of *decentralized co-operation* summarizes the objectives which must be attained to avoid the exodus of skills. In general terms, it is a matter of establishing a mode of exchange between the North and the South on a more clear, more flexible basis, better adapted to a reciprocal enrichment based on the concept of endogenous development. In practical terms, it is a matter of multiplying and reinforcing the students' and material exchanges and the training programmes having limited and precise objectives.

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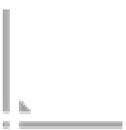
# List of participants at the meeting of the Workshop

The participants at the meeting of the Workshop on the Social monitoring of scientific production system, in September 2001, came from three continents. The wealth of these proposals is to be attributed to them. However the drawbacks of this presentation must not be imputed to them.

**Mme Isabelle Tarradellas**, animatrice de programme, Fondation Charles Léopold Mayer, Suisse; **M. Ababacar Diop**, Juriste, représentant de l'ARPA (Aide à la Réalisation de Projets Africains), responsable de la caravane multimédia OSIRIS (Observatoire sur les Systèmes d'Information, les Réseaux et les Inforoutes au Sénégal), Sénégal; **M. Abdelhamid Chorfa**, Ancien Directeur des Etudes à la Présidence de la République algérienne; ancien Expert-Consultant de l'Institut de Stratégie d'Alger; actuellement Secrétaire de l'Association algérienne de Prospective, Grenoble, France. **Mme Ghislaine Jacquier**, Project manager in Albania, Geneva, Switzerland; **Ms Claudia Lenzner**, Molecular Biologist, journaliste, France; **M. Lazare Ki-Zerbo**, Responsable de l'Espace Lecture Multimédia du Centre d'Etudes pour le Développement Africain (C.E.D.A); Editeur du bulletin DJIGUI (L'Espoir); Chercheur dans le programme (2001 - 2002) "plaidoyer sur l'impact de la libéralisation au Burkina Faso", Burkina-Faso; **Prof. Jüri Engelbrecht**, President of the Estonian Academy of Sciences, Estonia. **Ms Manonmanii Krishnamohan**, Laboratory Analyst (Nutrients) at Queensland Health Scientific Services, Coopers Plains, Australia; Worked formerly as an Environmental Education Officer for an autonomous centre of Excellence of the Ministry of Environment and Forests, Government of India.

Synthesis edited by Frédéric Piguet, facilitator of the Workshop, [apsab@bluewin.ch](mailto:apsab@bluewin.ch), <http://www.apsab.span.ch/>

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# The Alliance for a Responsible, Plural and United World

## Working together towards the challenges of the 21<sup>th</sup> century

Ever since the late eighties of the 20th century, numerous initiatives have been put forward from different regions of the world and extremely diverse contexts. Different social actors were thus put in motion with the aim of organising a vast worldwide process seeking to explore values, proposals and regulations capable of overcoming the modern challenges humanity is faced with.

A large number of thematic, collegial and continental meetings were organised in the early nineties, a process which led, in 1993, to the drafting of the *Platform for a Responsible and United World*.

Regional groups were set up, international professional networks and thematic networks on the fundamental issues of our era were developed: the Alliance was created. It is financially and technically supported by the Charles Léopold Mayer Foundation for the progress of Humankind (FPH), among others.

The Alliance is focussed on inventing new forms of collective action on both a local and global scale, with the aim of shaping together the future of an increasingly complex and interdependent world.

The challenge of the Alliance is to actively support unity in diversity by asserting our societies' capability to understand and appreciate the complexity of situations, the interdependence of problems and the diversity and legitimacy of geo-cultural, social and professional perspectives.

**The Alliance, as a space of discussion, reflection and proposals, is built around three main orientations:**

Local groups aiming to bring people of a community, a region, a country or a continent together by looking at the realities and issues of their own societies. This is the **geo-cultural approach**. It reflects the diversity of places and cultures.

Groups of socio-professional actors wishing to provoke dialogue and mobilisation within a given social sector or profession (youth, peasants, scientists, local representatives, etc.). This is the **collegial approach**. It reflects the diversity of social and professional milieus, their concerns and responsibilities towards society and the challenges of today's world.

Thematic workshops seeking to create reflection groups centred around the major issues of our common future (sustainable water management, regional integration and globalisation, financial markets, art and society, etc.). This is the **thematic approach**. It reflects the diverse challenges humanity is faced with in the 21<sup>st</sup> century. Thematic workshops are organised into four areas: Values and Culture, Economy and Society, Governance and Citizenship, Humanity and the Biosphere.

Seeking both to draw on the richness of materials and experiences gathered by these reflection groups whilst networking with other citizen dynamics with a similar focus, the Alliance fixed itself the objective of obtaining collectively developed, concrete proposals. The following meetings were thus organised:

- **international meetings**, for each thematic workshop and each college,
- **synchronized continental assemblies** (Africa, Americas, Asia, Europe) and a regional meeting in the Arab world (Lebanon) in June 2001.
- a **Citizen World Assembly**, held in December 2001 in Lille, France, bringing 400 participants together from around the world.

These meetings together contributed to the drafting of some sixty *Proposal Papers for the 20<sup>th</sup> century* and a *Charter of Human Responsibilities*, published in several languages in different countries.

The Alliance has been involved in a process of disseminating and developing these outcomes since the beginning of 2002. Networks are expanding, branching out and their work themes are becoming increasingly transversal. They also strengthen links with other approaches aiming to create an alternative globalisation.

For further information, please visit the **alliance website** at [www.alliance21.org](http://www.alliance21.org), where the history of the Alliance, the challenges it is engaged in and the workshops and discussion forums being held can be viewed in three languages (French, English and Spanish).

E-mail: [info@alliance21.org](mailto:info@alliance21.org)

# The proposal papers on the internet

Whether in their provisional or definitive form, all the proposal papers and their corresponding translations can be accessed on the website of the Alliance for a Responsible, Plural and United World, at:

<http://www.alliance21.org/fr/proposals>

## Themes available:

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