The future of Nanotechnologies in public Debates and social Protests

What does it mean to call for revolt against Science?

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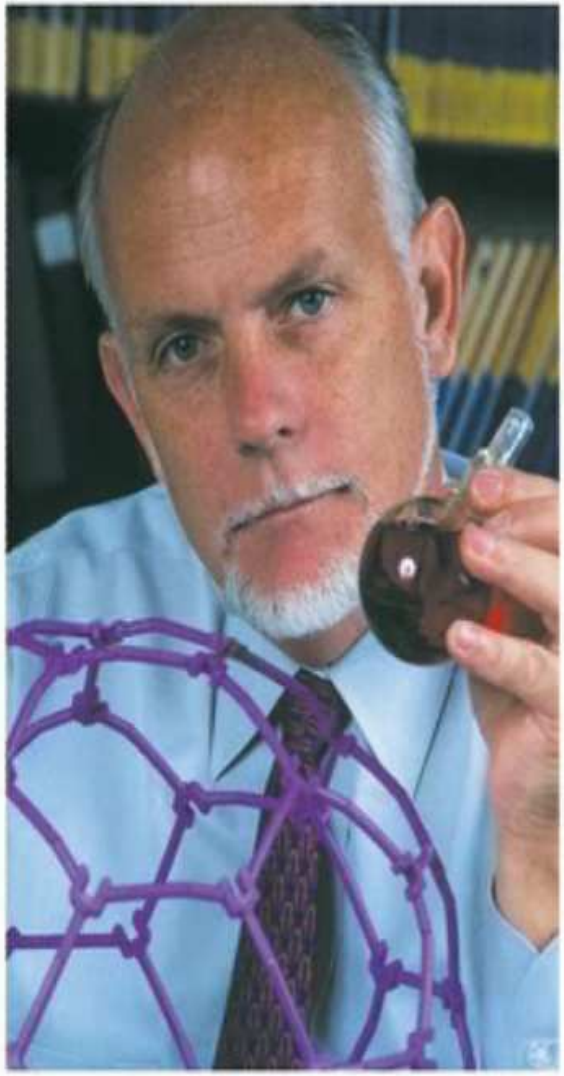
(EHESS, Paris)

Normative pluralism & Nanotechnologies

Workshop NanoNorma, Ravigo, 3rd June 2010

Nanotechnology: What's That?



Nanotechnology:

"The art and science of building stuff that does stuff at the nanometer scale"

Richard Smalley
Nobel Prize Winner, Chemistry (1996)

(1943 - 2005)

1. **Recent and ongoing studies on nanos, developed by GSPR**

2. **A brief theoretical point on argumentative sociology and the ballistics of public issues**

3. **The trajectory of nanos in France and in some European countries**

4. **How technical democracy is put to test by radical criticism**

5. **Finished or unfinished humanity ?**

6. **Resisting by interiority**

1.

Recent and ongoing studies on nanos, developed by GSPR

- 2004-2005: **Nanoscience, prophecies and the matrix of futures**

- 2008-2009: **The mode of existence of nanotechnology in different public spaces in Europe : France, UK, Switzerland and the Netherlands**
- (CNano IdF with Jean-Michel Fourniau and Vincent Bullich)

- 2008-2010: **Nanoparticles, Health and Environment : on new metrological controversies** (with Josquin Debaz, in collaboration with AFSSET)

- 2009-2011: **Nanobiotechnological chimeras and post-humanity**
  (ANR with Jean-Michel Fourniau, Gilles Tétart, Marianne Doury, Assimakis Tséronis, Patrick Trabal, Mathieu Quet)

- 2010-2011: **What do nano researches produce on scientific collectives : paradigms, disciplines, tools and networks in nano field in Ile-de-France** (ANR / CNano with Jean-Michel Fourniau, Jean Foyer, Matthieu Hubert)

2.

A brief theoretical point on argumentative sociology and the socio-ballistics of public issues

Following actors and mapping controversies create many problems !

How do actors produce strong arguments ? How can an argument withstand the relevant criticism ? How do arguments converge or diverge in a disputing process ?	Norms, institutions and Governance Political representation and participatory democracy Collective mobilizations and social movements
The making of scientific facts Public proofs and scientific controversies Networks and heterogenous arenas	How do emerge a new risk ? Who blow the whistle ? What kind of public assessement ? Expertise and precautionary principle

On what context does emerge an argument – and a counter-argument?

What kind of trajectory does it take, and through which modifications?

What does it mean to resist to criticism?

Are the arguments immanent of the actor networks or are they produced by the disputing process itself, with a contextual relevance, impossible to reproduce at a distance?

How can an argument travel from small communities through different kinds of arenas and groups, winning in strength and in surface, and becoming, step by step, a watchword, a political tool, a rule of law or a common sense feature?

To understand the turning moments in the trajectories of arguments, we need to engage, in our conceptual and analytical toolbox, a good theory of argumentation able to work as close as possible to the actors' practical and critical reasoning.

Let us define argumentation by the following statement – which I share with Marianne Doury, a French linguist associated to my research group. This definition states in a few words :

An argumentation is a discourse or a device, linked or not to an ongoing action, which is organized through a disputing process – or its anticipation – in order to defend a standpoint, an opinion or a thesis, and designed to resist against hard and relevant contention or criticism.

It is to say that an argumentation contains, at least as implicit requirement, one or many counter-argumentations. A

Studying the forms of typification of the arguments which are used by protagonists of controversies or debates: *"This is not a good argument" « This is an argument ad hominem," « His reasoning lies on totally simplistic economic arguments ..." "it is not enough argument for ... "etc..*

See M. Doury, « La classification des arguments dans les discours ordinaires », Langage, « Les linguistiques populaires », 2004, n°. 154, pp. 59-73.

- “**Once** technology has fully teased out the constituent processes and structures of memory , cognition and personality , and given us control over them ; **once** we are able to share or sell our skills , personality traits and memories ; **once** some individuals begin to abandon individuality for new forms of collective identity ; **then the edifice of Western ethical thought since the Enlightenment will be in terminal crisis**.”

- Hughes / date:01/07/2001

“Conceptually , the lack of meaningful definitions of nanotechnology has led to the current situation that in almost all the science and engineering disciplines researchers **relabel their cutting-edge work " nano " , without having much new in common and without showing any remarkable degree of interdisciplinarity** (Schummer 2004a/b). In such a situation of hype , **cultural and social scientists may have difficulties to decide what research projects should really count as " nano "** , such that their choices might depend rather on mass media coverage and visionary promises than on the particularities of the actual research project . **The prevailing articulation of nanotechnology in visionary terms is the social aspect of nanotechnology's immaturity** , which brings about the second , more important problem .

[…]

Apart from scientists and engineers , policy makers , science managers , business people , journalists , transhumanists , and science fiction authors all talk about " societal and ethical implications " of nanotechnology . **They all seem to have already strong opinions about what the " societal and ethical implications " of nanotechnology will be** , that it will radically change society , bring about a new industrial revolution , can enable anything from immortality and paradise on earth to the extinction of the human race . How could cultural and social scientists , who have no expertise in fortune telling and are , instead , bound to their scholarly standards , contribute to a debate that is dominated by **such bizarre visions** ? How could their academic reflections compete with ideas about the " societal and ethical implications " of nanotechnology that are meant to stir the innermost hopes and fears of people ? It seems that , because of nanotechnology's immaturity , **it is either too early or too late for cultural and social scientists to become engaged in the debate.”**

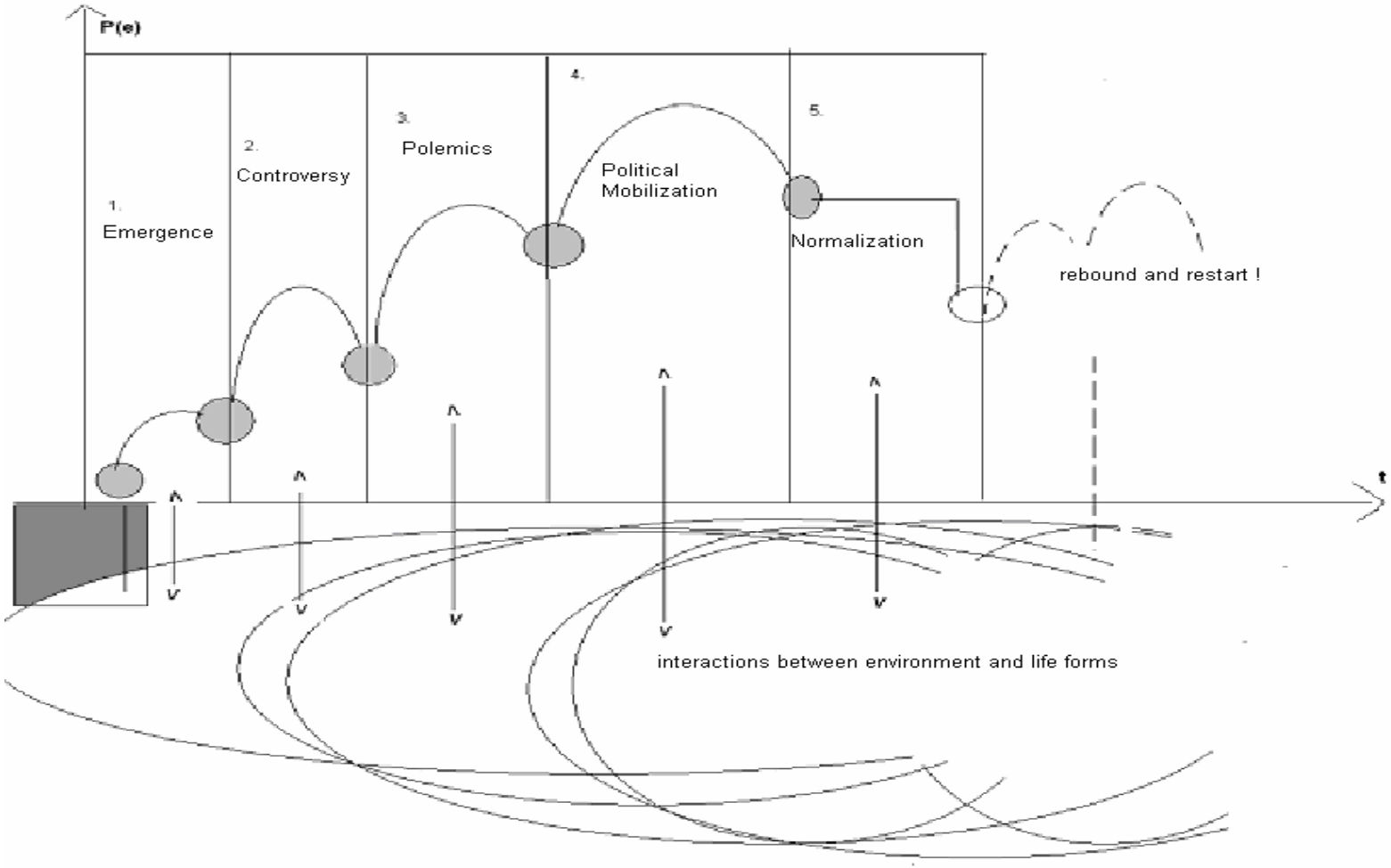
- Schummer, "Societal and Ethical Implications of Nanotechnology": Meanings, Interest Groups, and Social Dynamics, **12/2004**

Distinguishing regimes of action and argumentation

In Les Sombres Précurseurs ("The Dark Forerunners"), we have distinguished a range of seven main configurations (or "regimes of action") which operate like social frames and help actors to organize their actions and judgments.

Events, actors and argumentations, and, a fortiori, scientific expertises, do not play the same role according to the configurations in which they are mobilized.

- Normalization
- Crisis
- Legal action
- Denounciation
- Controversy
- Alarm
- Vigilance



A Ballistics of collective action

Ballistics and activism

Ballistics seems to be a very deterministic notion. Precisely, how do actors perform the right trajectory for an alarm, criticism and mobilization, and symetrically, how they fail to convince, to mobilize and to achieve their goals

Here is the link with the focus on radical criticism and activism : what is an activist job ?

- to push or to pull forward a problem – or a solution
- to open or close controversy or public debate – in order to have the last word
- to target public opinion and political sphere – by campaigns, demonstrations and performances
- to change law or institutions, or to defend them
- to implement real actions on the ground and get tangible effects, after resolutions officially taken
- Then collective actors are intentional ones and developp a ballistics

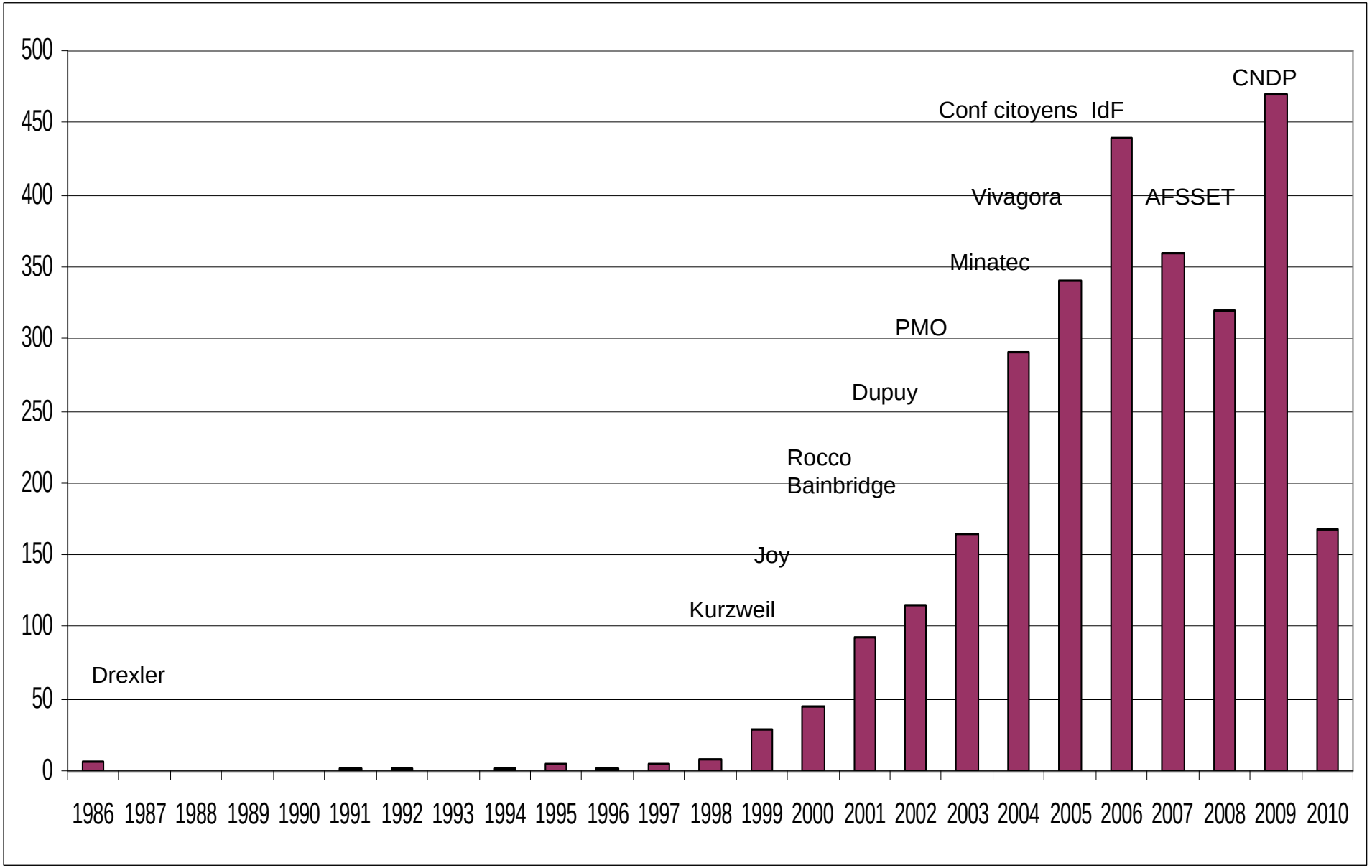
- But does our ballistics imply a teleological rationality ? Not if we take it in a pragmatic sense, that is if we look at variations and bifurcations, unexpected movements and effects, and at the same time, the capacity of actors to adapt, or not, context by context , on the ground, to change their targets in the course of action.

3.

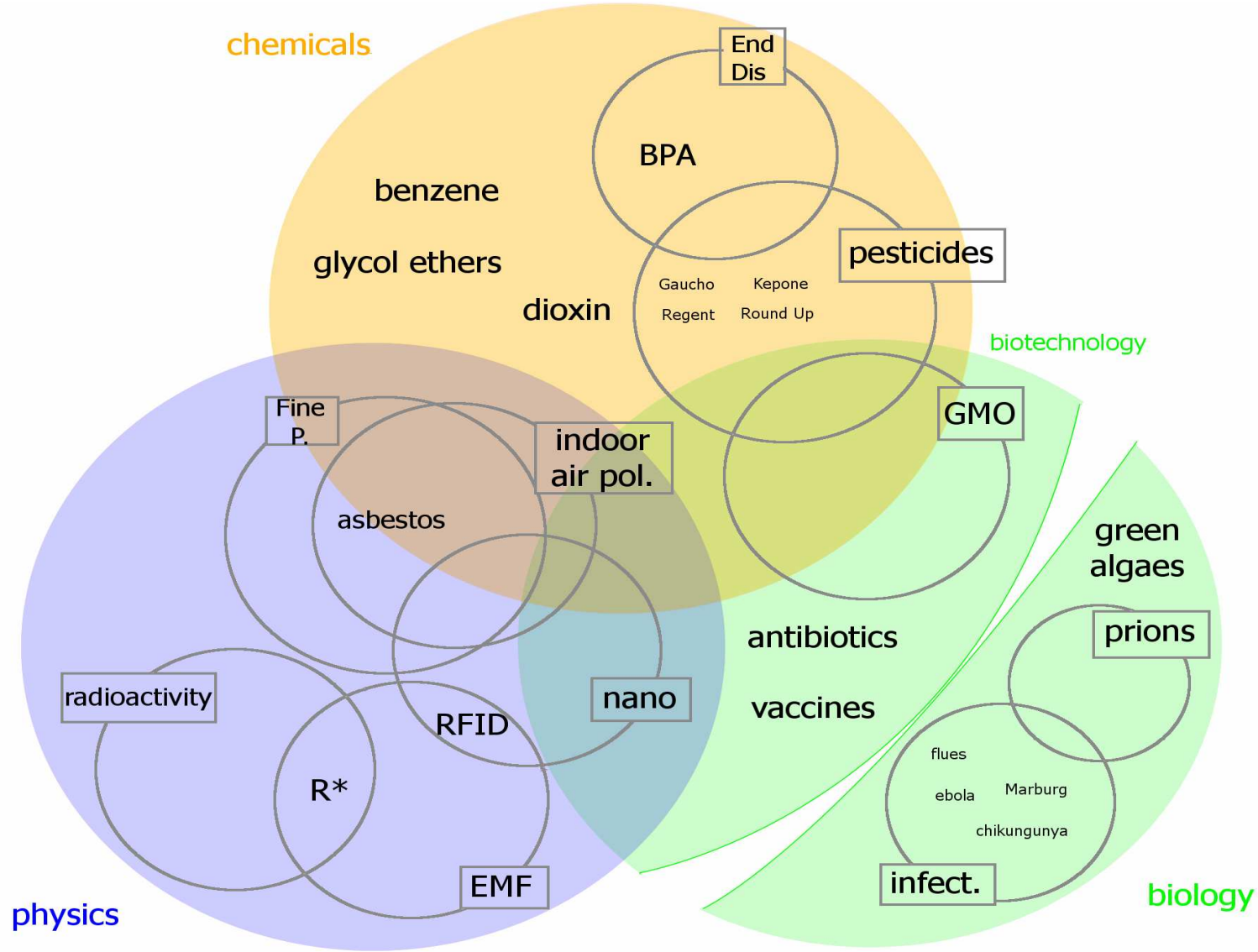
The trajectory of nanos in France and in some European countries

- Phase 1 (1999-2002): The promises of the nanoworld
- Phase 2 (2002-2004): The warnings coming from two precedents : asbestos and GMOs
- Phase 3 (since 2005): Multiplication of procedures of public participation and public debate

Trajectory of nanos issues in public arenas, profile got from the French corpus nano



Towards a spherology of toxicants … designed from a collection of corpuses on health&environment issues



This space of variation is very useful and the position of nanos in the spherology will evoluate in the future.

But, we must go beyond the usual issues on health and environment, by taking seriously the visions of the future and their effects on actors and networks. What kind of engagement and responsibility is produced by each new statement about "technological miracle“ ?

We must follow in the long run the trajectories of technical promises. Remember the precedents of cloning and gene therapy ...

Bainbridge, W.S. 2006. Cognitive Technologies. *Managing Nano-Bio-Info-Cogno Innovations: Converging Technologies in Society*, pp. 203-226. Berlin: Springer.

Organic Pioneer Says No to Nano ETC Group Welcomes World's First 'Nano-free' Standard
ETC Group 14 January 2008 www.etcgroup.org

- Now that you can drive your 'nano' car, listening to your iPod 'nano' while wearing 'nano' sunscreen and 'nano' clothing, the UK's largest organic certifier has just introduced the perfect nano-antidote – **a 'nano-free' standard for consumer products**. The Soil Association – one of the world's pioneers of organic agriculture – **announced today that it is has banned human-made nanomaterials from the organic cosmetics, foods and textiles that it certifies**. [...] "**A decade ago** the Soil Association led the way in creating a **safe alternative to GM crops** when they declared organic production to be GM-free and now they are trailblazing again – acting to protect the public from potential risks of engineered nanoparticles." **In 2003 ETC Group first called for a moratorium on nanotechnology research until governments adopt agreed-upon safety standards and regulatory oversight.**

  [...] The Soil Association has a long history of safeguarding food and agricultural products from potential threats. **In 1967** they published the world's first organic standard explicitly **banning pesticides, antibiotics and other chemicals** from organic farming. In 1983 they banned animal protein from animal feed 3 years before the first case of BSE (mad cow disease) was discovered in Britain. In 1994 they banned GM crops from food and farming -- five years before the UK food industry followed suit. In the wake of the Soil Association's 'no-nano' decision **other organic agriculture groups in North America and Europe are now examining whether to ban nanomaterials from their organic standards as well.**

- A year ago ETC Group announced the result of its graphic design competition **for a universal warning symbol for nanotech** that could be used in workplaces and on products. [...]

- The Soil Association ban comes in the same month that the UK's largest consumer association will launch its campaign to protect the public from risky nanomaterials in consumer products, following the lead of the US Consumers Union which has called for mandatory labeling, regulatory oversight and increased funding for risk-related research.(5) It also follows **growing annoyance in civil society** that repeated warnings over nanotech safety risks are being ignored by nano-boosting governments

ANCHORPOINT

NANO-HAZZARD SYMBOL – DESIGN COMPETITION

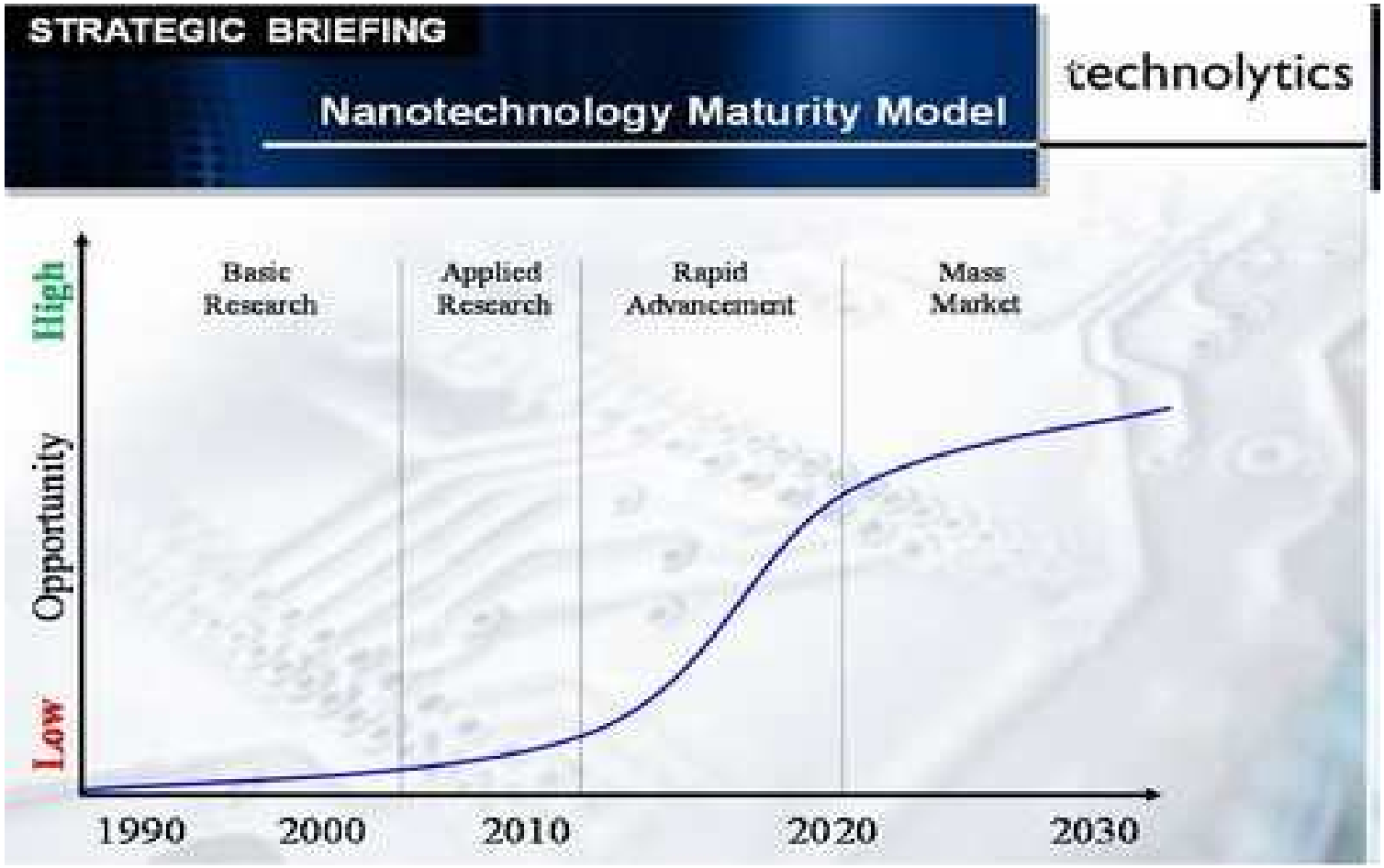
Ottawa, Canada -

Biotechnology, nuclear power, toxic chemicals, electromagnetic radiation — each of these technological hazards has a universally recognized warning symbol associatedwith it. So why not nanotechnology — the world's most powerful (and potentially dangerous) technology?

Take a look at a catalogue of entries here.

Why Do We Need a Nano-Hazard Symbol?

Nanotechnology, the manipulation of matter at the tiny level of atoms and molecules, has created a new class of materials with unusual properties and new toxicities.It used to be that nanotechnology was the stuff of science fiction. Today, however, there are over one thousand nanotechnology companies worldwide. Nanoparticles, nanotubes and other engineered nanomaterials are already in use in hundreds of everyday consumer products, raising significant health, safety and environmental concerns. Nanoparticles are able to move around the body and the environment more readily than larger particles of pollution. Because of their extremely small size and large surface area nanoparticles may be more reactive and more toxic than larger particles of the same substance. They have been compared to asbestos by leading insurance companies who worry their health impact could lead to massive claims. At least one US-based insurance company has canceled coverage of small companies involved with nanotechnology. Unlike more familiar forms of pollution arising from new technologies, nano-hazards (potentially endangering consumers, workers and the environment) have yet to be fully characterized, regulated or even subject to safety testing. The US Food and Drug Administration will have its first public meeting about regulating nanomaterials on October 10, 2006. Most governments worldwide have yet to even begin thinking about nano-regulation. Nonetheless, nanoparticles invisible to the naked eye are already in foods, cosmetics, pesticides and clothing without even being labelled. Every day laboratory and factory workers could be inhaling and ingesting nanoparticles while the rest of us may be unwittingly putting them on our skin, in our body or in the environment.It's not just a safety question. Nanotechnology also raises new societal hazards: The granting of patents on nano-scale materials and processes, and even elements of the periodic table, allows for increased corporate power and monopoly over the smallest parts of nature. Some designer nanomaterials may come to replace natural products such as cotton, rubber and metals — displacing the livelihoods of some of the poorest and most vulnerable people in the world. In the near future the merger of nanotechnology with biotechnology (in nano-biotechnology applications such as synthetic biology) will lead to new designer organisms, modified at the molecular level, posing new biosafety threats. Nano-enabled technologies also aim to 'enhance' human beings and 'fix' the disabled, a goal that raises troubling ethical issues and the specter of a new divide between the technologically "improved" and "unimproved."ETC Group has called for a moratorium on nanoparticle production and release to allow for a full societal debate and until such time as precautionary regulations



Kevin Coleman
Technology Analyst , Nanotechnology Now, 6th April 2010

Août
2009

GROUPE DE SOCIOLOGIE PRAGMATIQUE ET REFLEXIVE

Ecole des Hautes Etudes en Sciences Sociales

DU MODE D'EXISTENCE DES NANOSCIENCES ET DES NANOTECHNOLOGIES DANS L'ESPACE PUBLIC

C'Nano Idf – Région Ile de France

Compte rendu détaillé

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- Timing difference in the development debates in different countries is explained by the presence or absence "of actor-carriers" from "civil society" that give a minimum visibility in public space.Increasing involvement of unions and consumer associations which partially offset the weak mobilization of large NGOs.

- A weak mobilization of NGOs had an important impact on the general mobilization (eg the Netherlands).

- Specificity of Switzerland: the role of insurance companies in educating public and policy makers. Low level of involvement and interest of people on nanotechnology.

- Peaks of mobilization are considered outdated in Switzerland and United Kingdom.

Regimes and objects of public discussions

	Netherlands	**Switzerland**	**United Kingdom**	**France**
Framing	Risks and economic opportunities: challenge of restructuring electronic sector	Risks and citizen involvement in the governance of technology	Risks and citizen involvement in the governance of technology	Distrust in relations between State, Scientists and industrial elites. Series of political crises around Risks and the Independence of expertise
Precedent	GMOs	Asbestos GMOs	Mad cow GMOs	Tainted blood Asbestos Mad cow Nuclear GMOs
Media coverage	Low main framing on scientific and technological innovations presence of the question of nanotoxicity	Low TV shows featuring futuristic frames, with great emphasis on science fiction	Low sensationalist articles in the mainstream press economics in the specialized press	Irregular, with some intense peaks Strong focus on Minatec then the strange « debate » CNDP

4.

How technical democracy is put to test by radical criticism

"Ideally, risk assessment and regulatory procedures would impose no costs on anyone ; however, because of imperfections in knowledge and because of uncertainties, the choice of evidentiary standards is in effect a choice between imposing ***overregulations***, ***overcompensation***, *and their associated costs, and imposing health and other costs on individuals because of* ***underregulation*** *and* ***undercompensation***. *Beyond the law, however, I will argue that justice (and distributive considerations more generally) requires that priority be given to avoiding the latter. [...] (1) the standards of evidence ought to be appropriate to the institutional context and (2) justice requires that priority be given to avoiding false negatives and underregulation. One requires justification of the epistemic presupposition, the other, justification of the underlying moral view."*

Carl E. Cranor, Regulating Toxic Substances. A Philosophy of Science and the Law, Oxford University Press, 1993, p. 152-153.

EUROPEAN COMMISSION

Understanding Public Debate on Nanotechnologies

Options for Framing Public Policy

Edited by René von Schomberg and Sarah Davies[1]

A Report from the European Commission Services

1 Dr Sarah Davies was a member of the DEEPEN project team. She is currently a Visiting Researcher at the Center for Nanotechnology and Society at Arizona State University. Dr. René von Schomberg is based at DG Research of the European Commission.
This working paper is written for the publication series of the Governance and Ethics Unit of DG Research. The views expressed here are those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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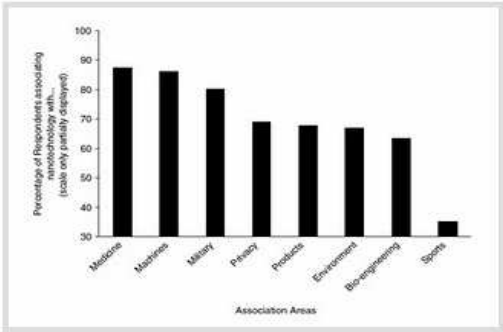
nanopublic

public opinion, media, and emerging technologies — (c) scheufele (2010)

Friday, May 07, 2010

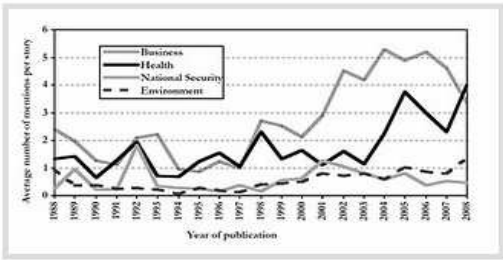
what people think when they think about nano ... and what role google may play in all of this

When asked in U.S. public opinion surveys which topics or applications they connect with nanotechnology, almost nine out of 10 members of the lay public mention the medical field as one of these connections.



(Based on: Cacciatore, M. A., Scheufele, D. A., & Corley, E. A. (forthcoming). From enabling technology to applications: The evolution of risk perceptions about nanotechnology. Public Understanding of Science. doi: 10.1177/0963662509347815http://pus.sagepub.com/cgi/content/abstract/0963662509347815v1)

This is somewhat surprising, for at least two reasons. First, systematic analyses of newspaper coverage of nanotechnology in the U.S. show health-related topics as one of the dominant areas emerging for nanotechnology.



(Based on: Dudo, A., Dunwoody, S., & Scheufele, D. A. (2009, August). The emergence of nano news: tracking thematic trends and changes in media coverage of nanotechnology. Paper presented at the annual convention of the Association for Education in Journalism & Mass Communication, Boston, MA.)

About the author

Dietram A. Scheufele is the John E. Ross Chaired Professor in the Department of **Life Sciences Communication** in the **College of Agricultural & Life Sciences** at the **University of Wisconsin**.

Click here for more information about graduate education in Life Sciences Communication.

Short nanopublic updates via Twitter

- u.s. spends more per birth that any other nation; has higher maternal mortality than 40 other industrialized countries http://bit.ly/afe9xS about 19 hours ago
- synthetic life breakthrough rekindles "playing god" framing of emerhing science http://bit.ly/apRy1X 2 days ago
- #who study has no clear answer on mobile phones and cancer http://bit.ly/94J8tk 6 days ago

Primers on public opinion and media coverage of emerging technologies

Ladwig, P., Anderson, A. A., Brossard, D., Scheufele, D. A., &

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mass media (55) nanotechnology (42) science communication (20) framing (18) public opinion (16) science (10) UW-Madison (7) outreach (7) regulations (7) environment (6) religion (6) social science (6) rankings (5) risks (5) benefits (4) global warming (4) politics (4) public understanding of

One hundred of participatory or consultative procedures

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Source : CIPAST, 2008
(Citizen participation in Science and technology)

About Nanopodium

Nanopodium is a platform for exchanging thoughts, ideas, opinions and best practices on nanotechnology. The aim is to stimulate a public dialogue about the opportunities and threats of nanotechnology and resulting applications with regard to individuals and society as a whole.

Nanopodium is an initiative of the independent Committee for the Societal Dialogue on Nanotechnology in the Netherlands (CMDN).

The Committee was founded on 31 March 2009 to stimulate the debate on nanotechnology and develop public opinion in this area, more specifically on the social and ethical issues involved. While the debate on nanotechnology, its opportunities and risks, has been going on for a number of years, this discussion has to date been limited to a small circle of specialists and organisations. The Dutch government has therefore decided to stimulate a broader societal dialogue.

The independent Committee has been asked to initiate a broad, societal dialogue in which different views can be expressed freely. This will be achieved by inviting individuals and organisations to propose activities to stimulate the dialogue.

The results of the societal dialogue – starting in December 2009 and lasting one year – will be evaluated by the end of 2010 and will lead to into an Agenda for Nanotechnology, which will be presented to the Dutch government.

The Agenda for Nanotechnology will be used as an important input for Dutch policies on nanotechnology and its applications. Research institutes and companies will probably also make good use of the results of the societal dialogue to develop their own strategic agenda.

Recent developments

During the first call for project proposals, held in October 2009, the Committee received 80 proposals, of which they took 73 into consideration. Of the 44 projects asked to submit a full proposal, 21 were selected; the funding budget is 2.5 million euro.

The projects – to be carried out during the coming six months – are divided into five groups: television programmes, publications for a broad audience, activities for secondary school children, science cafes/debates, and other.

A second call for proposals has been closed on 8 February 2010.

NANONIEUWS

28/05/10 - 29 mei 2010: Wetenschapsfestival Nanotopia!

18/05/10 - Drinkwaterbedrijven volgen de nanodiscussie op de voet

06/05/10 - 12 voorstellen gehonoreerd

29/04/10 - Samenwerken vergroot bereik projecten

28/04/10 - Nanotechnologie - een gevaar voor je privacy?

› Alle nanonieuws berichten

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Some impacts of radical protest on the governance of risk activities

The comparison of different fields of public controversies and conflicts allows us to distinguish different regimes of government.

- In the nuclear field, as is not much surprising, the state appears as an authoritarian and dirigist one - especially in France where the Gaullist heritage is important: here, political history is a huge constraint for the authors-actors.

- In GMOs, the state tries, since the turning point of 1996 – confronting with the mad cow crisis and the surge of activism against GMOs, led by Greenpeace at the beginning – to be an arbitrator between different camps, and to build a compromise, as the European commission does, between economic interests and environmental arguments. But, a closer look on debates and negotiations, shows that it's more complex: many actors defend the idea that GMOs offer no interest for European agriculture; on the other side, we find the claim which underlines a decrease of research and development capacities in agrobiotechnologies.

- Nanotechnologies are at the crossing-point: a part of clear hierarchical management (attested by the presence of CEA and different related firms, like Minatec, in this new field) and a part of arbitration between a serious application of the precaution principle on the one hand, and the stimulation of innovation, with the great hope to save economical and technological growth in France on the other hand.

Nuclear	Organization of different public debates, which create a precedent: the introduction of deliberative democracy in a domain marked by strong asymmetry of powers. The CNDP, the French commission for public debate organized in 2005 and 2006: - a debate on nuclear wastes - a debate on new reactors (EPR, but also ITER) - and a debate on HT power lines … These debates do not end conflict but create a turning point for many actors
GMOs	Multiplication of researches on dissemination and contamination in the real world, and about economical conditions of coexistence between different types of cultures. In France the « Grenelle of environment » was presented as a opportunity to shape an agreement; but frictions within agriculture milieu are deep … Unexpected positions were taken in the recent period: *« Coexistence will be determined according to the principle that "the choice of some should not impact the choice of others", says M. Le Grand [UMP senator for la Manche].There must not be pollination of organic fields by GMOs»(* *« Everyone is in agreement on the GM issue: it is not possible to control their spread. So we will not take the risk. » (Jean-Louis Borloo, French minister of the environment,2007)*
Nanotechnologies	Industry and state spokesmen are pushed to reconsider ways of public consultation (citizen conferences …) and to organize a clear separation between different sources of alert and dispute: - nanoparticules and toxicity; - nanoscience as pure research under ethical control; - nanomedicine as new technological promise - nanopuces and social control as specific domain A group like PMO refuses these separations and tries to show a strategy of fragmentation

cndp

Commission nationale du débat public

Bilan

du débat public sur le développement et la régulation des nanotechnologies

15 octobre 2009 – 24 février 2010

dressé par le Président
de la Commission nationale
du débat public

9 avril 2010

- Confédération Française des Travailleurs Chrétiens 1
- CFE-CGC 1
- Confédération Française Démocratique du Travail 1
- **Conseil Economique et Social Rhône Alpes 1**
- Conseil Economique et Social de Bretagne 1
- Conseil Economique et Social de Franche Comté 1
- Conseil Economique, Social et Environnemental 1
- Le Collectif sur les Enjeux des Nanotechnologies à Grenoble 1
- **CNRS CEA** 1
- Association pour La Prévention de la Pollution Atmosphérique 1
- Association Nationale des Industries Alimentaires 1
- Les Amis de la Terre 1
- **Association Française Transhumaniste** 1
- **Agence Française Sécurité Sanitaire Enivronnement Travail 1**
- **AFSSA 1**
- Association Force Ouvrière Consommateurs 1
- **AFNOR Normalisation 1**
- **Académie des Technologies 1**
- **Académie des Sciences 1**
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- **Académie Nationale de Médecine** 1
- VivAgora 1
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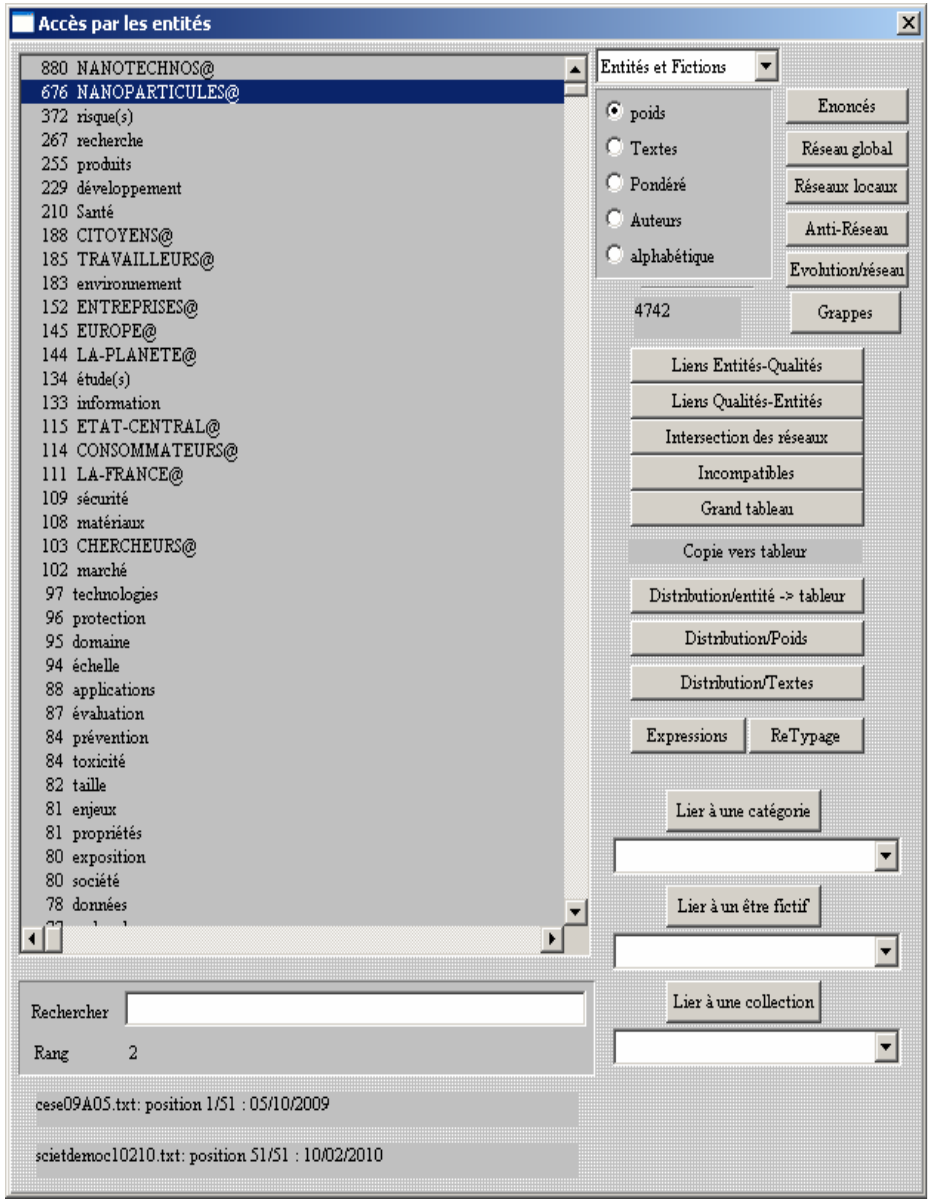
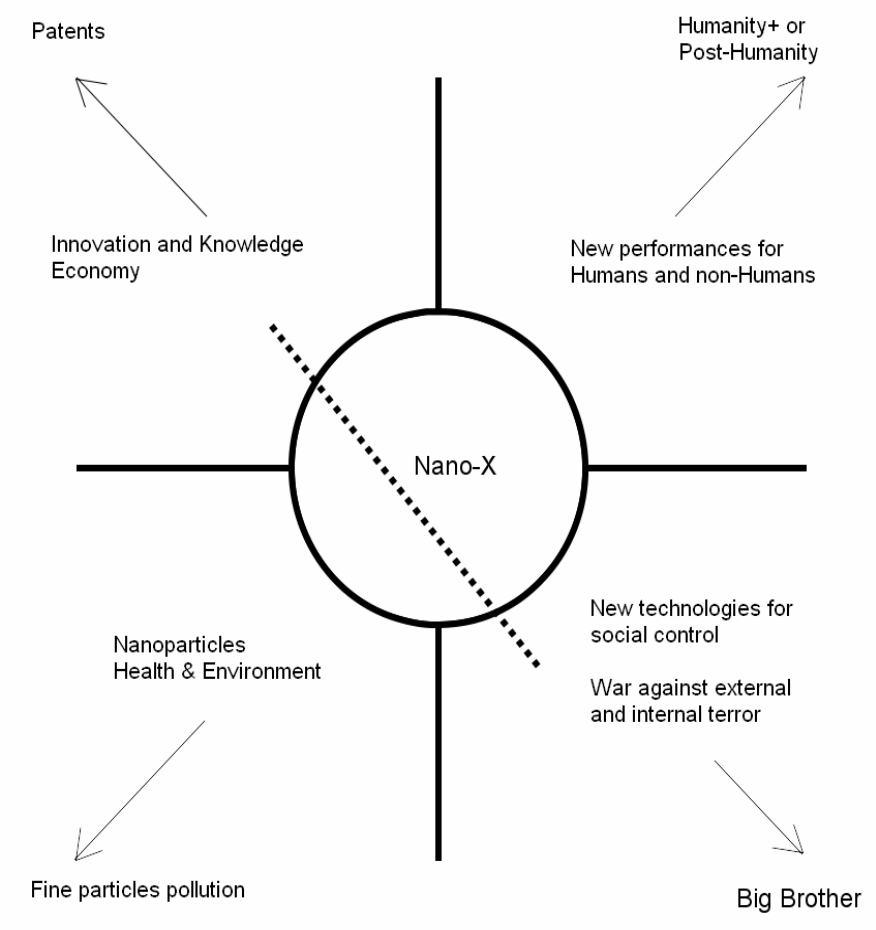
- Association Sciences et Démocratie 1
- ORDIMIP 1
- Mouvement des Entreprises de France 1
- **Les Verts 1**
- Les entreprises du médicament 1
- Institut de Recherche en Santé Publique 1
- Institut national de la santé et de la recherche médicale 1
- Institut National de Recherche et de Sécurité 1
- Institut National de recherche en informatique et automatique 1
- INERIS 1
- INDECOSA-CGT 1
- Institut National de la Consommation 1
- **Fondation Sciences Citoyennes 1**
- Force Ouvrière 1
- France Nature Envinronnement 1
- Forum Mondial Sciences et Démocratie 1
- Fédération InterDépartementale de l'Environnement Avignonnai 1
- Familles Rurales 1
- Entreprises pour l'Environnement 1
- **Conseil régional d'Île-de-France** 1
- Conseil National des Ingénieurs et Scientifiques de France 1
- Confédération de la Consommation, Logement et Cadre de Vie 1
- **Commission Nationale de l'Informatique et des Libertés 1**



Mixing together or dissociating different public issues ... in different arenas ... that's a part of the question ...



- Enhancing Human Performances, Transhumanism and Post-Humanity ;
- New scientific policy, research management and global competition: knowledge economy, patents ;
- New society of constraint :what kind of control by citizens on surveillance artifacts in daily life ;
- Risk issues in health and environment : nanomaterials, nanoparticles and toxicology : regulating toxic substances.

Nanotechnology in Risk society	**Economics of sciences and technologies**
- **New sanitary Risks**. Lack of well-stabilized metrological devices, then governance is in front of a big problem : how to avoid to repeat **asbestos** - The problem of proliferating and networked nature of nanotechnology. **Can nanoproducts be considered as chemicals** ? See "EPA : Define nanomaterials as "new" chemicals under the Toxic Substances Control Act (TSCA)" - **Dilution of responsibilities** related to the reticular character of development projects around the nanos - **Loss of grasp on ordinary activities** in which integrate more and more invisible artifacts (nano chips, ubiquitous computing, Internet of things …) - **Technological Apocalypse** with an irreversible destruction of nature (variants of gray goo…)	- Overflow of all epistemic and ontological categories leading to a **blurring of boundaries** between science fiction and real science - **False epistemological rupture** and **stunts of advertising** that produce alignments around the label nano - Overstatements producing **not feasible technological promises** - a new generation of **sorcerer's apprentices** who **ignores the lessons of the past** (idem with the synthetic biology) - **loss of control over technological processes** controlled **by firms with intellectual property on all forms of matter**
Humanism + or -	**Democracy**
- **Loss of sense of the concept of humanity** -> Fighting against technology, putting human being at the center (Bernanos, Ellul, Illich, neo-luddism) - producing differences within humanity : break in commun humanity, elitism and transhumanism (from which proceeds, paradoxically, the*Transhumanist Declaration*. …) - **Assault against interiority, taking power on consciousness** - the end of the human exception and of subjectivity	- **deficit of democracy** despite great precedents (nuclear, mad cow, GMOs, etc.) : technical democracy as a technique of social acceptability - **propensity to treat political issues by the way of science and technology**; "headlong" (making the choice to repair the damage caused by modern life, to suppress hunger, to save the planet by techniques …) - new tools for **panoptic society** under the paradigm of **global security** : invasive dimensions of techniques for tracking and surveillance of individuals and groups. Small and Big Brothers everywhere …

The Citizens' Alliance on issues of nanotechnology has opened, on June 1st, 2010, a citizen watch website on nanotechnology.

"The twenty first century will begin to see a shift toward consciousness and personhood-centered ethics as a means of dealing **not only** with brain death , but also with extra-uterine feti , intelligent chimeras , human-machine cyborgs , and the other new forms of life that we will create with technology."

Hughes, "The Future of Death", Journal of Evolution and Technology, 01/07/2001

« So let's face it: Ultimately, humans are by no means rational creatures. Be it in argument, in politics, in decision making of any kind or in how we see events, we are far more emotional than rational. 9 times in 10, emotional appeals will win arguments, and not logical argumentation**. I think that one of the primary benefits of the oncoming virtualization of the human mind, combined with nootropics and generally increased freedom of motion for the information within a human brain, will be to let humans think in a rational manner.** This will allow us to do all of the things that science fiction has long been promising: Expansion out into the galaxy, and creating a utopia. »

- On Humanity+ forum, Posted 17 May 2010 - 08:18 PM

- “The expenditures , however , are in striking contrast with the extremely limited nature of the health impact studies of nanotechnologies (through their life cycle from production to ultimate waste) and with the very insufficient funding thus far budgeted for this type of investigation . **These technologies not only affect human health but also raise social and ethical issues** . From a health standpoint , it is precisely the technologically advantageous properties of nanoparticles that may raise problems .This report considers environmental and occupational health issues . **It does not take into account** data concerning biomedical applications; AFSSAPS is examining this issue , which requires access to regulatory files and applications for marketing approval of this type of product .”
- Committee for Prevention and Precaution (French), 15/05/2006

5.

Finished or unfinished humanity?

« Against Technology » (neo-luddism) versus against « poor human condition » (transhumanism)

"Technology, above all else, is responsible for the ***current condition of the world*** *and will control its future development. Thus the 'Bulldozer' that we have to destroy is modern technology itself. Many radicals are aware of this, and therefore realize that there task is* ***to eliminate the entire techno-industial system****."*

(source : cited by Steven E. Jones, in "Neo Ludd in the Age of Terror", in Against technology. From the Luddites to Neo-Luddism (2006, p. 217))

"The ***Humanity+*** *(the World Transhumanist Association) is an international nonprofit membership organization which advocates the ethical use of technology to expand human capacities. We support the development of and access to new technologies that enable everyone to enjoy* ***better minds, better bodies*** *and* ***better lives****. In other words, we want people to be* ***better than well."***

(source : World Transhumanist Association)

Transhumanist Declaration

The Declaration was originally written in 1998 by an international group of authors, and then modified and re-adopted by the Humanity+ membership in 2002. This revision was adopted by the Humanity+ Board in March 2009.

(1) Humanity stands to be profoundly affected by science and technology in the future. We envision the possibility of broadening human potential by overcoming aging, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth.

(2) We believe that humanity's potential is still mostly unrealized. There are possible scenarios that lead to wonderful and exceedingly worthwhile enhanced human conditions.

(3) We recognize that humanity faces serious risks, especially from the misuse of new technologies. There are possible realistic scenarios that lead to the loss of most, or even all, of what we hold valuable. Some ofthese scenarios are drastic, others are subtle. Although all progress is change, not all change is progress.

(4) Research effort needs to be invested into understanding these prospects. We need to carefully deliberate how best to reduce risks and expedite beneficial applications. We also need forums where people can constructively discuss what should be done, and a social order where responsible decisions can be implemented.

(5) Reduction of existential risks, and development of means for the preservation of life and health, the alleviation of grave suffering, and the improvement of human foresight and wisdom should be pursued as urgent priorities, and heavily funded.

(6) Policymaking ought to be guided by responsible and inclusive moral vision, taking seriously both opportunities and risks, respecting autonomy and individual rights, and showing solidarity with and concern for the interests and dignity of all people around the globe. We must also consider our moral responsibilities towards generations that will exist in the future.

(7) We advocate the well-being of all sentience, including humans, non-human animals, and any future artificial intellects, modified life forms, or other intelligences to which technological and scientific advance may give rise.

(8) We favour allowing individuals wide personal choice over how they enable their lives. This includes use of techniques that may be developed to assist memory, concentration, and mental energy; life extension therapies; reproductive choice technologies; cryonics procedures; and many other possible human modification and enhancement technologies.

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Cosmic Engineers Defend Transhumanism's Radicalism

Jan 17, 2009

The **Order of Cosmic Engineers** are a group of transhumanists who are focused on building their activity in online virtual reality worlds. They include IEET Board member Giulio Prisco and IEET advisor Martine Rothblatt. They have recently issued the "**YES! to Transhumanism" statement** which is a call to **arms for defense of radical transhumanism against pressures to downplay the more challenging and futuristic aspects of the transhumanist perspective**.

YES! to Transhumanism

Transhumanism is both a **reason-based worldview** and a **cultural movement** that affirms the **possibility and desirability**, for **those who choose** it, of **fundamentally improving the human** condition **by means of science and technology**. Transhumanists seek the continuation and acceleration of the **evolution of intelligent life** beyond its currently human form and human limitations by means of science and technology, guided by life-promoting principles and values.

Visionary, bold and fun. That is what transhumanism has always been.

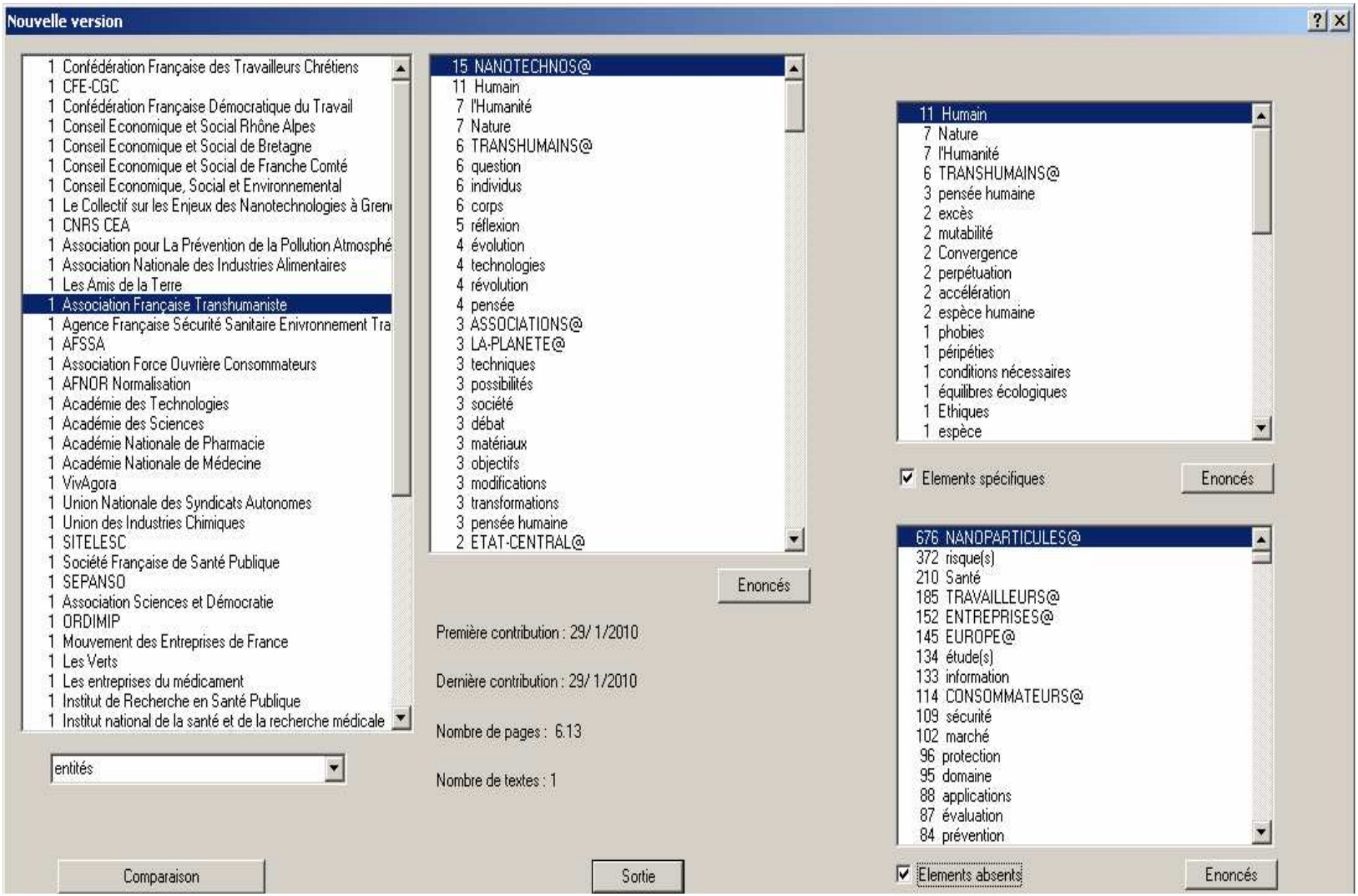
Transhumanists have always sought personal improvement; to free themselves from all the **limitations of biology**; to radically upgrade their mental and physical faculties; and to beat a path to the stars.

This is what transhumanism is. What it has always been. This is what transhumanism ought to continue to be.

With due concern, we fully and deeply realize that there are, have always been and will continue to be **complex scientific, technical, cultural, moral, societal and political challenges** to deal with. They require **careful assessment**, **planning, and leadership**. These challenges need to be met head on with due courage, forbearance, focused attention, rationality, compassion, empathy and wisdom.

We must and will continue to do our best to overcome them. **We will persevere to mitigate their potential and actual dangers, while safeguarding the maximizing of their potential and actual benefits.**

Corpus focused on « cahiers d'acteurs » (CNDP 2009)



Freedom through Technology

- Technology frees us from the tyranny of Nature
- Hunger, sickness, aging, death
- We'll never control everything,
- but…

May we have the strength to change what we can, the serenity to accept what we can't change, and the wisdom to know the difference
(Reinhold Neibuhr)

Are You a Transhumanist? Ten questions

How Many of these Statements do you Agree With?

	Yes
Do you believe that people have a right to use technology to extend their mental and physical (including reproductive) capacities and to improve their control over their own lives?	☐
Do you think that by being generally open and embracing of new technology we have a better chance of turning it to our advantage than if we try to ban or prohibit it?	☐
Do you expect human progress to result from human accomplishment rather than divine intervention, grace, or redemption?	☐
Do you think it would be a good thing if people could become many times more intelligent than they currently are?	☐
Do you DISAGREE with the idea that human genetic engineering is always wrong because it is "playing God"?	☐
Does your ethical code advocate the well-being of all sentient beings, whether in artificial intellects, humans, posthumans, or non-human animals?	☐
Do you believe women should have the right to terminate their pregnancies?	☐
Do you think it would be a good thing if people could live for hundreds of years or longer?	☐
Would you consider having your mind uploaded to computers if it was the only way you could continue as a conscious person?	☐
Should parents be able to have children through cloning once the technology is safe?	☐
Total	

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6.

Resisting by interiority

The hypothesis of subjective mind as the last mode of resistance in front of invasive sciences and technologies

Previously, in a not so distant past, resistance was associated with the idea of network -choosing network to resist against the established order. But, nowadays, once the network has become the norm, how to set up resistance ? It seems that many actors will engage a new political anthropology of interiority.

Le « for intérieur »
How to translate “for intérieur” in shakespearian language ?
In “my heart of hearts” , “deep down inside”, «inwardly »

- **« And yet it is the only ground of opposition, irreducible, to nanotechnology … »**

  « *C’est contre ses tendances les mieux acquises, contre son propre machinisme que chacun doit se dresser, pour se dresser contre la Machine .**Et c’est pourtant le seul motif d’opposition irréductible** aux nanotechnologies , nouveau degré dans la technification totalitaire et notre intégration à la Machinerie - dont on ne discutera pas ici s’il s’agit d’un processus sans sujet , ou si le démon émergent n’est pas justement cette Machinerie .* »
  PMO, « La proie, c'est nous », 22/09/2003

- **« …violate our conscience, to decipher our mental activity, and to manipulate our behavior …** »

  « *La neuropolice, chaque jour davantage, accroît ses moyens de **violer notre for intérieur**, de déchiffrer notre activité mentale, et de manipuler nos comportements.* »
  PMO, Le Pancraticon ou l'invention de la société de contrainte, 30 mars 2008

- **« the night of two-faced men struggling with the angel of the coherence ... »**

  « *En vain. "**Quelque part**", comme dit le babil contemporain, **c’est-à-dire en son for intérieur**, on sait, on n’oublie pas, on s’afflige. Nous vivons **la nuit des hommes-doubles en lutte avec l’ange de la cohérence**. L’entêtement des réalités tranche les contradictions. Quand elles deviennent insupportables, on ne supporte plus.* »
  PMO, 15 octobre 2008