

4S-EASST Conference Paris, 26-28 August 2004

9:00-12:30 - Session S-93 – École de Mines/Vendôme

Hugh LACEY - *Legitimation of using transgenics: the interplay of empirical investigation and social values*

Marcelo LEITE - *Communicating biotechnology in Brazil: the failure of scientific and public proofs among widespread anti- and pro-technoscientific fundamentalisms*

Laymert GARCIA DOS SANTOS - *Scientists and progress*

Andrea LORENZET - *Public Re-definitions of Biotechnologies. The Debate on GMOs in the Italian Press*

Communicating biotechnology in Brazil: the failure of scientific and public proofs among widespread anti- and pro-technoscientific fundamentalisms

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ABSTRACT

Science journalism in Brazil has always been expected to enlighten public discussion of biotechnology issues, achieving the kind of rational clarification traditionally associated with scientific proof. The task was doomed from the beginning, since actors both anti- and pro-GMOs procured only the external traits of scientific proof to their arguments, and never actually engaged in making the necessary adjustments to turn them in what could be called public proofs, i.e. arguments which could remain valid when values are brought into consideration and discussed as the basis of all choices and opinions (scientists' and advocates' ones there included). The disguising of inbuilt values by both parties as non-negotiable and non-debatable ingredients of "objective" proofs has had as a result that the subject - particularly the introduction of GMOs in agriculture- is plagued by "fundamentalist" views. Moreover, it seems that a basic lack of scientific background, among the general public as well as among lawmakers and judges, has prevented democratic bodies and institutions from independently assessing the arguments thrown unto the public and from escaping the sterile polarization which still pervades the issue. The outcome of such a murky public discussion is a 5-year long undecided decision process, disputed regulations, widespread smuggling of GM seeds from Argentina and its subsequent unlawful propagation in Brazil. Scientific and public proofs seem now to have been irrevocably replaced by good old "faits accomplis".

Communicating biotechnology in Brazil: the failure of scientific and public proofs among widespread anti- and pro-technoscience fundamentalisms

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Since the object of this talk today is to extract some lessons and reflections from the GMO controversy in Brazil, it might be useful to begin with a brief overview of this debate in my country. Brazil is now the major exporter of soybeans in the world, and both its production and productivity have been going up steadily, stimulated by growing demand in China, specially. So far only Monsanto's variety of herbicide-resistant soybeans have gone through the licensing process in Brazil, although it has been halted in the courts. Nonetheless, at least 4% of soybeans grown in Brazilian fields in 2003 were genetically modified and therefore had an illicit origin. Roundup Ready seeds, the variety resistant to the herbicide Roundup (whose generic name is glyphosate), have been smuggled from neighboring Argentina to Southern Brazil, initially to the State of Rio Grande do Sul, and covertly multiplied by farmers, thus spreading to other states such as Paraná and Mato Grosso do Sul.

The sluggish regulation process has been going now for more than five years, since the National Technical Commission on Biosafety (better known by the acronym CTNBio¹) issued a license for commercial release of RR soybeans in 1998, which was then challenged in the Court by Greenpeace Brazil and by a consumer's rights advocate group, Idec. The final decision from the Courts is still pending. Besides demanding labels on transgenic products, which were not provided for in the license, the plaintiff NGOs have argued that CTNBio did not hold a mandate to dispense with an environmental evaluation of GM crops, as it did while licensing Monsanto soybeans. According to Greenpeace's and Idec's interpretation of the 1988 Constitution, which has so far been upheld by the Courts, the decision power to license potential environment-damaging activities remains in the hands of Brazil's federal environment protection agency, Ibama.

The legal situation today is one of regulatory anarchy. The previous administration, under the rule of President Fernando Henrique Cardoso, has come forward with a clear and candid position in favor of GMOs, and has unsuccessfully tried to disentangle the jurisdiction conflict between agencies by means of presidential decrees termed "medidas provisórias" which broadened the scope of CTNBio's mandate. At the same time, enforcement agencies have allowed the spread of illicit cultivation of GM soybeans in Southern Brazil, probably anticipating the completion of the licensing process, but also because they lack the material means to control and test all soybean farms. In parallel, the public discussion has been polarized between two extreme views: in the right corner, soybean growers, government officials and researchers close to biotechnology, such as molecular biologists and breeders; in the left corner, environmentalists and advocates for small farmers and for family or so-called "organic" agriculture, such as the Landless Movement, better known as MST.

¹ <http://www.ctnbio.gov.br/ctnbio>

The stalemate continued in the new administration with President Luiz Inacio Lula da Silva, who has been exceptionally allowing the planting and marketing of GM soybeans, again by means of presidential “medidas provisórias”. But Lula’s administration has also come forward with a revamped Biosafety Bill intended to replace an outdated law from 1995. The bill had its first Congress round in the House of Representatives. The amended bill maintains in the hands of Ibama the power to demand or to dispense with environmental studies about the impact of GM crops, but at the same time provides for an overarching National Biosafety Council, which would have the power to overturn or review decisions from lower federal agencies in case of persistent conflict, or else “in the national interest”. Now the new legislation still has to go through the Senate floor, a process which will probably be kept at bay until local elections take place in October. But it has already been amended in the Senate, in order to give CTNBio some of its licensing powers back, and this means that the changes have to be approved by the Lower House.

It is somehow astonishing that a democratic society has not been able to decide, after more than five years, whether it is going to include a particular technology in its development effort. I think the main reason for the unresolved state of affairs results first and foremost from the deep polarization of the issue in Brazil. On the one hand, agribusiness, science and government establishments are convinced that agrobiotechnology is strategically required for development, and lend their weight into approving and licensing it for the use of Brazilian farmers. On the other hand, NGOs still can count on a receptive audience for its anti-GMO position of principle, among widespread and vague mistrust towards biotech in the general public, who associate transgenic foods with the breeding of monsters by genetic engineers. According to a national poll conducted by the private polling institute Ibope² with 2,000 interviewees in December 2002, only 37% among them had heard before of transgenic foods. After a brief explanation, though, 71% declared they would prefer not to consume them, and 92% stated that the novel foods ought to be labeled. (The survey had been paid by an NGO alliance called Campaign for a GM-Free Brazil.)

One may explain this undecided state of affairs by blaming ignorance amongst the Brazilian public, which allegedly refuses what it cannot understand. This has time and again been said by pro-biotech campaigners. The issue cannot be so easily dismissed, though. Countless public relations and advertisement campaigns have been launched by biotech companies in the country, as well as seminars and workshops for media people, but they all failed to alter the opinion landscape. One of the reasons for the failure, or even the major one, lies in the fact that campaigns and seminars place all their bets in the polarization itself, trying to drag ordinary citizens and media people to one of the opposing fields: either you are in favor of biotech, and therefore on the side of mankind and progress, or you are against them, with no intermediary positions left. From this perspective, to raise doubts about GMO’s efficacy beyond strict biosafety aspects, say the issue of sustainability or social justice, automatically amounts to become a sort of warrior of the dark forces, someone who is accessory in preventing altruistic scientists from erasing mankind’s greatest burden, famine. To raise questions about the scope and representativeness of the Biosafety Commission, as some journalists have done, was regarded as the same as to put in jeopardy the reputation and personal conduct of its members. The attempt to check claims that GM golden rice would prevent thousands of child blindness cases and deaths in Asia was taken as almost genocidal.

² <http://www.idec.org.br/paginas/emacao.asp?id=247>

First of all, it is important to remember that Brazilian soybean production *and* productivity have been going up in Brazil even with a marginal participation of GM plants, so that the alleged Brazilian slowness in adopting biotechnology by means of genetic engineering of crops, especially in contrast to, say, Argentina, doesn't seem to have significantly harmed the country's performance and competitiveness in the international market. This is a matter of fact, and obviously does not mean that the delay in regulating and adopting GM technology will not have negative economic impact in the near or remote future; but, in the other hand, the Brazilian experience does not authorize the postulation of a direct causal relation between the adoption of biotech and an immediate competitiveness increase, at least not in the soybean business. Nonetheless, the competitiveness argument is used over and over in the public arena, as if it were immune to facts that by and large disprove it.

On the opposing field, there was no less intense a reaction from NGO people towards journalists who tried to develop an independent and science-based view of biosafety issues, with resource to peer-reviewed research and not to received ideas about scientific progress or backwardness. There was of course no room to debate whether the insistence on vague theoretical risks would not serve the purpose of covering for ethical and principled objections to biotechnology and genetic engineering, which would be far more legitimate if overtly assumed and not disguised as scientific reasons and proofs. Once disclosed or assumed as values and not proofs, though, those legitimate reasons would have to be pragmatically negotiated with other stakeholders and their conflicting and incommensurable values.

Another example of NGO-type of discourse about GMOs which is not easily reconcilable with research data is the tendency to speak in generalizing terms of biotech-induced risks, as if all GM products would involve similar risks, be it GM soybeans engineered to become resistant to a particular herbicide, or GM Bt corn engineered to secrete insect pesticides in its own cells. As is widely known, each GMO results from a different DNA insertion and leads to the expression of quite different proteins, with different effects on human beings and on the environment –if any, by the way. To state that Roundup Ready soybeans are much less harmful to wildlife than Bt corn was equaled with betrayal to the cause of wildlife that each and every journalist was expected to defend, at least from the environmentalist point of view.

The low quality of arguments and its disconnectedness from the few undisputed facts available is not restricted to highly charged fields of dispute such as the GMO controversy, but tend to drive the public debate off the tracks in many a field related to life technosciences in general, such as reproductive or therapeutical cloning and assisted reproduction. But given the fact that food is not only a package of nutrients but a carrier of traditions and social values as well, it should have been easy to predict that GMOs would not be immune to this kind of argument decaying. I recall a former CTNBio chairperson making a presentation with a fierce attack against GMO opponents while showing PowerPoint slides of desperately scared English peasants in the Eighteenth Century facing inoculation with material from cowpox blisters, or of Rio de Janeiro dispossessed dwellers in the wake of the Twentieth Century who attacked public health officials assigned to prevent the spread of Yellow Fever, an episode which came to be known as the Vaccine Rebellion. Such historical examples, intended to instantiate how persistent

anti-science behavior is supposed to be, are not only anachronical, but also eloquent demonstrations of how authoritarian the defence of science merely projected benefits can become. They are all based on the deficit model of science literacy studies, according to which lay people reject innovation because they lack appropriate information, and, as soon as this is provided, they are bound to accept it. Well, the persistence of the GM controversy should be enough to prove otherwise.

On the opposing field there is plenty of examples, as well, of how distorted arguments can be. Enemies of GMOs to a great extent take advantage of a diffuse public mistrust of genetic engineering to make headway with their own agenda. Although in my own experience I have never heard a representative of Greenpeace Brazil speak of “Frankenfoods”, the fact is that they do nothing to prevent the proliferation of such less than objective conceptions; moreover, they tend to react negatively when some other actor, say, a journalist, tries to do so. They also tend to pass for established and proved facts many risks which remain theoretical at best, such as the possibility of food allergies to be provoked by glyphosate-tolerant soybeans, something which has not occurred after almost a decade of GM-soy consumption in many countries.

NGO’s all too effective communication strategy seems to rely mainly on the capitalization of the public’s lack of confidence in the apparently disturbing recombinant DNA technologies. This sort of default public attitude towards genetic engineering was seeded 30 years ago, ironically, by molecular biologists themselves, who were not sure then of the risks involved in cutting and pasting DNA molecules, and called for a moratorium and laboratory security standards around the time of the Asilomar Conference. Most of those fears have proved greatly unfounded, in strict biosafety and risk analysis terms, but anti-GMOs campaigners still address the public as if this were still the case. But of course there are other kinds of considerations underpinning the public’s attitude, and they ought to be considered on their own right.

As PRIEST (2000) already pointed out, the fear of genetic engineering shows a close relationship with the public’s attitude towards nuclear energy. A high proportion, some 30% of her interviewees in the U.S. believed that both these technologies can cause more harm than good. This is not necessarily an irrational belief, according to MARTINS (1998, p. 109) from the London School of Economics: “Unfortunately for patronizing practitioners of Technological Risk Analysis, lay people manifest a regrettable tendency to give less thought to the vanishing low (close to zero) probabilities of disaster, than to the scale and to the uncontrollable spatial diffusion, to the transgenerational duration and to the horrible threat (carcinogenic, mutagenic, teratogenic) of effects on people and animals, in the extremely improbable case of a catastrophic accident”.³ There is indeed some rationality in refusing a technology whose risks, tiny as they may be, might eventually bring about unthinkable consequences, at least in the perception of the public. Although this is certainly not the same kind of rationality implicit in quantitative risk analysis, one must learn to start a dialogue with it.

³ “Infelizmente para o papel tutelar dos praticantes da ART [análise de risco tecnológico], os leigos manifestam uma tendência lastimável a pensar menos nas baixíssimas (quase zero) probabilidades de desastres e muito mais na escala, na difusão espacial incontrolável, na duração transgeracional e nocividade horrorosa (carcinogênica, mutagênica, teratogênica) dos efeitos nas pessoas e nos animais no caso extremamente improvável dum acidente catastrófico.”

What is more, one needs to segregate such understandable mistrust from fantasies vaguely inspired by science fiction. The latter have to be pointed out by those who aim to take a *bonna fide* role in the debate, be they scientists, environmentalists or journalists. Consider for a moment this appalling excerpt from one of the judicial decisions which have suspended the licensing process of herbicide-tolerant soybeans in Brazil. Mister Justice wrote: "I think that the irresponsible speeding one intends to bring to the advancements of genetic engineering, (...) guided by the greedy deregulation of global business, may generate a weird civilization of alien hosts with venomous faces in the dawn of a new millennium". The point I have made elsewhere is that this kind of X-Files pseudo literature has little to do with law or science.

One might even consider appropriate, as I do, that journalists now and then take a stand and make judgments concerning some very controversial issue, provided that facts and /or good reasons have convinced her or him of the most objective analytical interpretation to choose, but it is generally accepted that it is not permissible for them to reach the point of embracing a crusade. During more than two years of intensive reporting about GMO issues, from 1998 to 2000, my work has tried to spell out all the weak and doubtful points that were to be found quite easily in the arguments from one side or the other, under the light of available facts and peer-reviewed scientific research. On the other hand, there was never a direct answer to the question that wouldn't go away: whether the journalist-turned-expert, in the absence of more reliable sources, was for or against GMOs, and whether in the end, all things considered, they are beneficial or not. The standard reply was that the question makes no sense. First, because there are all kinds of GMOs, each with different outcomes and different risks involved. Second, because there will not ever be an objective and scientific final answer to that million-dollar question, only political ones: decisions that have to be made through institutions and civil action in democratic societies.

Given the fact that the public debate was already irreversibly split in two fields, at a certain point vicious attacks started coming from both sides. Members of the Biosafety Commission and a few scientists began to shun away from interviews and contacts, apparently because they thought some stories were not enough pro-science as they should come from a science journalist, or because they were allegedly instrumental in raising suspicion about their personal conduct. There was also criticism from a Greenpeace campaigner, who started posting attacks to those stories in an internet discussion list, on the grounds that the author was not well informed about the "real" issues and probably was on the payroll of biotech companies.

This sort of reaction illustrates in a quite eloquent manner how positions have crystallized in extreme attitude poles which I dubbed "fundamentalist" well before September 11th and the subsequent wrongful association of this word with Muslim views. There are many different ways of being a fundamentalist, including a pro-science and an anti-science one. In a perfect world, such as the world envisaged by the Modern Age, each citizen would think and decide with his or her own mind, based on the maximum of objective information gathered by Science writ large. Problem is, there is no such a thing as an ideal world, and actually there never was. The public sphere is less than perfect everywhere, to a great extent because stakeholders act as if values and preferences were not always intertwined with their apparently more "factual" judgments.

We are condemned to build, reconstruct or reform those public sphere conditions and capacities, even if we know beforehand they will never get close to ideal standards. It is time to reinstate a common ground in which an innovative debate can take place, in which stakeholders respectful of independence and tolerance will start to weight facts, interpretations and arguments for their intrinsic value, not from their origin nor for their usefulness to one or the other side. In practical terms, leaders of the research community, provided they are not politically engaged for or against biotech, take a step to generate and gather information about biotechnologies, maybe an international effort to build experiments similar to the field-scale ones recently carried out in the United Kingdom, but spread over a wider range of natural, cultural and socioeconomic environments. One has to go a step further from what was already obtained by a group of Science Academies around the world, which have taken an important stand on biotech in July 2000. Unfortunately, it has been widely interpreted as a blunt manifest pro-GMOs, in spite of the many sober and balanced calls for caution and restraint that were to be found in the document.

Then the information gathered in those independent studies, which need also to be broader in scope and take into account issues such as sustainability and social justice related to agricultural practices, would have to be brought to the general public in each country, preferably in the form of opens meetings such as consensus conferences or popular juries, in order to reach out to lay people. A further important objective is to make sure the information gets to those in position of turning opinions and judgments into social facts, such as lawmakers, judges and media people.

The way out of this conundrum would be doing what we, social and natural researchers, have been trained to do: to learn from experience, to ask new questions or rephrase them in a more productive formulation, to seek unexpected answers, and to reinvent ways to publicly interpret and negotiate them. Short from that, there will be only room for a persistent mockery of a dialogue, which at least in Brazil has so far brought agricultural biotech into a legal and regulatory dead-end and now threatens to induce a similar stalemate in the stem-cell debate.

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