

## SCIENCE COMMUNICATION AFTER SEPTEMBER 11

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### Abstract

The great impact of September 11 on society and public opinion is still there for everyone to see. But the terrorist attack and the anthrax letters circulating in the U.S. in October 2001 have greatly affected the mechanisms of science communication as well – a tangible evidence is the Statement on Scientific Publication and Security of February 2003. In what way was it mirrored in lay press and scientific journals?

We analysed articles on bioterrorism published by a daily newspaper, the American New York Times, and two scientific journals, Science and Nature. The identified articles were then grouped into seven different topics: science, health, research policy, security, politics, economics and ethics. Surprisingly, politics and economics make up together for 22% of the articles analysed for Science, and the percentage goes up to 34% for Nature – figures similar or even much higher than those found in the New York Times (23%).

The debate on bioterrorism seems therefore to have deeply influenced science communication, opening up for ethical, political and economic aspects in the narration of science, which further deepen the links between science and society.

**Keywords:** bioterrorism, science communication, media studies

### 1. Introduction

The events of and following September 11, 2001 have had strong repercussions on science, regarding both its public image and the mechanisms of science communication. The objective of the present study is to investigate how and when bioterrorism and, as a result, science was mentioned in the press. This was carried out through the analysis of the daily newspaper New York Times and two science magazines Science and Nature, in order to verify what has changed from a communicative point of view following September 11.

One of the most striking results of the circulation of anthrax spores via mail in the following October and the growing fears of attacks using biological weapons was scientists' decision for preventative self-censorship in February 2003.

Scientists in the United States had to face up to a communicative state of emergency which made them targets for criticism and accusations and forced them to look for new strategies for collaboration between such diverse fields as politics, economics and science.

According to the German sociologist Ulrich Beck, the implosion of the Twin Towers has been followed by an "explosion of silence", thanks to the lack of concepts and words suitable to express the western world's feelings. Moreover, Beck refers to this situation following September 11 as a "collapse of language" [1]. The very language, concepts and words used during and about September 11 about bioterrorism are the subject of our research.

### 2. Methodology

In order to shed light on the diverse mechanisms of communication at work regarding bioterrorism, a comparison was made between two very diverse media: daily newspapers and science magazines.

Attention was focussed on a newspaper that is considered to be opinion leading in the United States (and in the Western countries too): The New York Times. By opinion leading we refer to outlets that are read by decision makers for information and by other journalists for inspiration: they are considered to influence the public sphere, as well as to mirror national attitudes. Opinion leading press is the privileged information source for a country's ruling class and moulds its public opinion. Therefore, an analysis based on opinion leader press can be used in an attempt to gain an understanding of the transformations within societies involved [2].

To study the position taken by scientists in this regard and to monitor the dynamics that brought about preventative self-censorship, we carried out an analysis of the two most important international science magazines: Science and Nature.

Both for the newspaper and science magazines, the analysis is divided into two basic parts: in the first phase, the electronic archives of the various publications were searched for articles containing the keyword 'bioterrorism', in order to obtain a guide of when this topic was mentioned.

To be specific, the respective searches were carried out in the on-line archives: the New York Times archive is available from January 1996, Science from October 1995. The Nature electronic archive dates back to 1987 but, as with Science, the search was run from October 1995. We collected respectively 140 and 69 articles on bioterrorism published by Science and Nature between October 1995 and June 2003. The digital archives were used for a primary quantitative analysis of the media coverage concerning bioterrorism and the effects of the events of September and October 2001.

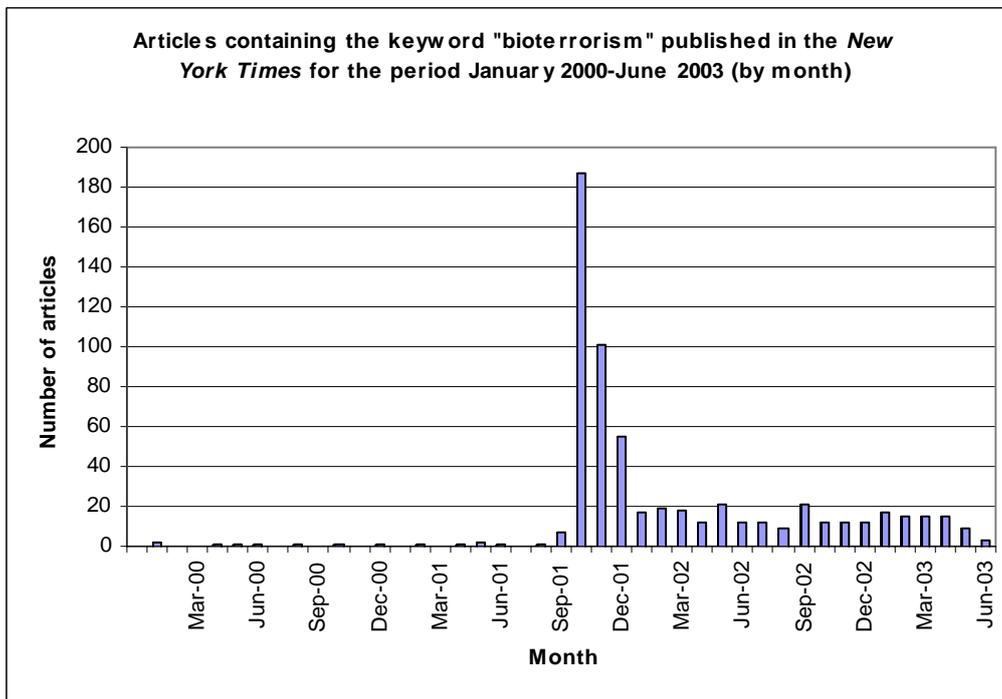


Figure 1. Search results from the New York Times  
(Per an easier reading, the dates start from January 2000)

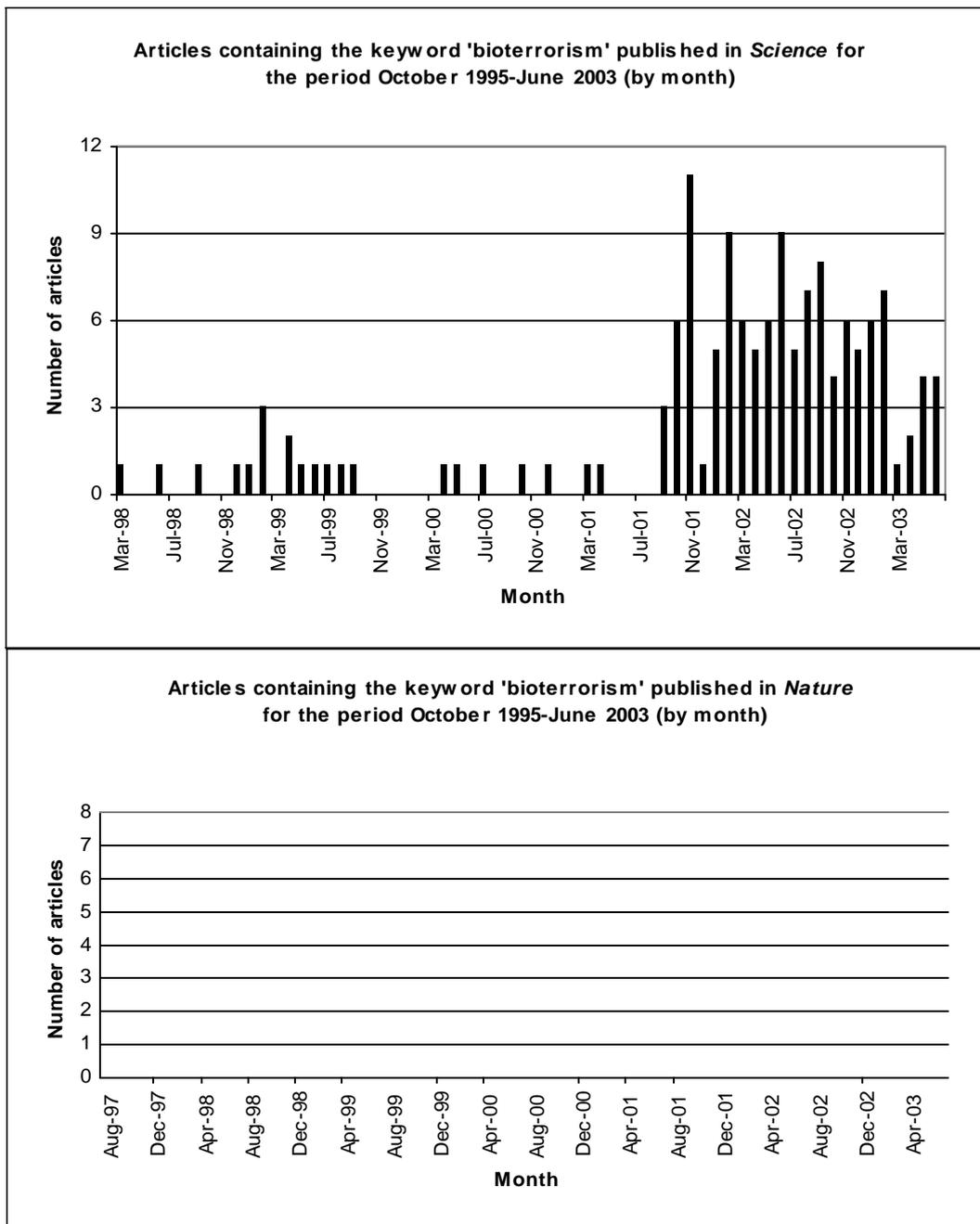


Figure 2. Research results from *Science* and *Nature* for the keyword 'bioterrorism'.  
(Per an easier reading, the dates start from the first published article)

Here we can observe a typical journalistic process at work: a steep increase in articles written after September 11 and a gradual drop off in interest; the articles in the two magazines also increase at the end of 2001, but in this case, interest in the topic remains constant at least until the ratification of the Denver Declaration (February 2003).

It was seen, therefore, (Figures 1 and 2) that the Twin Towers attack and the biological attack with the anthrax spores via mail on the following October introduced bioterrorism to the journalist's agenda and reinforced the attention given to these topics in science magazines.

### 3. Qualitative analysis

The qualitative research has been made after the choice of a precise temporal range (based on data from the quantitative analysis).

For the articles in *The New York Times*, a decision was taken to carry out a qualitative analysis of articles published only during the crisis period since, as mentioned before, journalistic interest in the issue gradually dropped off until it received only a salutary mention in the newspapers. The most significant periods from the quantitative analysis were taken into consideration: September – October 2001 for *The New York Times*.

Instead, in an attempt to better chart the evolution of new methods of carrying out and communicating science, the relationships between scientists and politicians and reflections on freedoms in science and self-censorship, it was decided to make a qualitative analysis of all the articles collected from *Science* and *Nature* in the former quantitative analysis.

The texts were read and classified monitoring: their typology (articles, news, comments, letters and interviews) and the narrative frames. The concept of frame refers to the processes (such as presentation, interpretation, selection and emphasis or vice versa exclusion) of events' elaboration mass media typically resort to in organising the elements of their storytelling. «To frame is to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, casual interpretation, moral evaluation, and/or treatment recommendation» [3].

#### 4. Typology of the extracts

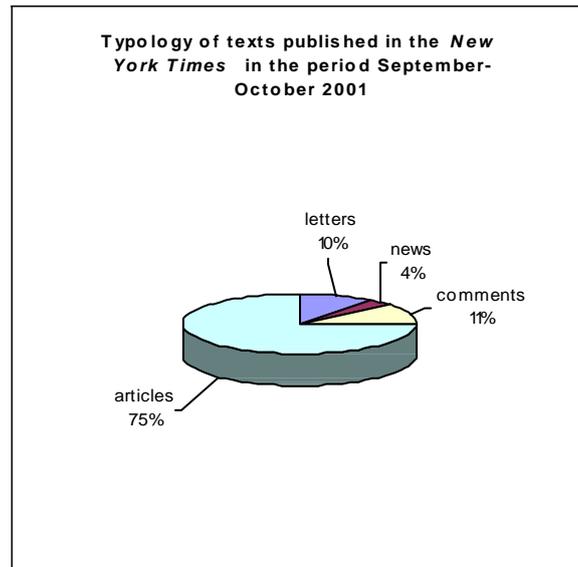


Figure 3. Typology of the extracts from the New York Times

There were no interviews in the *New York Times*: in US journalism, in order to guarantee correctness and impartiality of information, there is a tendency to present several viewpoints in each article. During the conference “The Anthrax Scare and Bioterrorism”, organised by The Brookings Institution during a project entitled “The Role of the Press in the Anti-Terrorism Campaign”, the *Washington Post* journalist Ceci Connolly explains this choice by saying that there is very little coordination between scientists and politicians and therefore no official, authoritative voice to report. Other than news articles and analysis, a large part of the *New York Times* is made up of reader’s comments and letters: the city’s population are personally involved in the debate on bioterrorism.

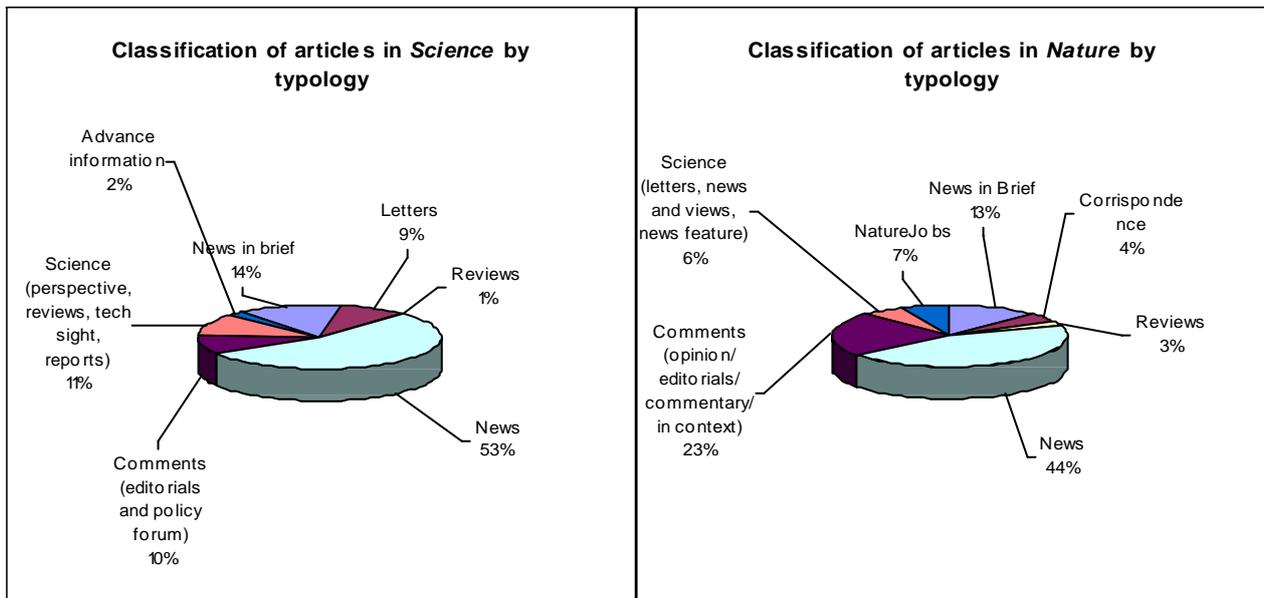


Figure 4. Typology of texts in magazines

In Science the majority of the texts are news and articles, written by journalists on the editorial staff, who report news items regarding science and the scientific community, or the voices of scientists and politicians: almost 70% of the total is made up of news and news in brief sections. Bioterrorism, therefore, takes up a large part of the news items, as well as those ‘made to measure’ for scientists. If we classify these articles by typology, however, science slightly overtakes pieces with comment and reflection. Articles with reflection and comment on science (23% vs 10%) can be found in greater number in Nature than Science. This may be because Nature is not published in the US and therefore is at a distance and has more space for reflection.

## 5. Narrative frames

In order to understand how the bioterrorism emergency was reported, it is useful to divide the articles that are relevant for qualitative analysis into narrative frames: macro-themes can be identified that can be used as umbrella terms for giving each article a precise “interpretative frame”. For a few articles, in which different themes were present, a fraction of the article was assigned to different frames.

For the New York Times, four macro-frames have been identified: political; economic; health; security.

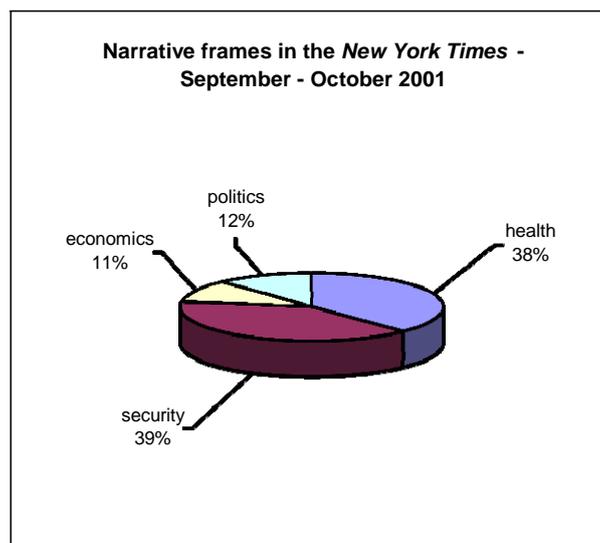


Figure 5. Distribution of narrative frames for the New York Times

From these figures we can conclude that the implications for health and public security make most news, which is understandable and predictable given that they deal with illnesses and terrorist actions to combat and avoid.

The science mentioned in the articles is of a practical nature, seen in an instrumental way: there is information about protection against pathogenic agents, news regarding possible vaccines or antibiotics, or the medical reports of victims,

and there are very few articles with an exclusively scientific aim. Instead, science takes on a relevant role in the journalistic tools that accompany the articles, explanatory information boxes and tables: it almost seems as though science is put in a corner, available only to those interested, as though journalistic language cannot be married with scientific language and should therefore be kept apart from it.

The narrative frames for the science magazines are slightly different: politics (national and international); research policy; health; security; ethics (freedom within science, freedom to communicate science); science; economics.

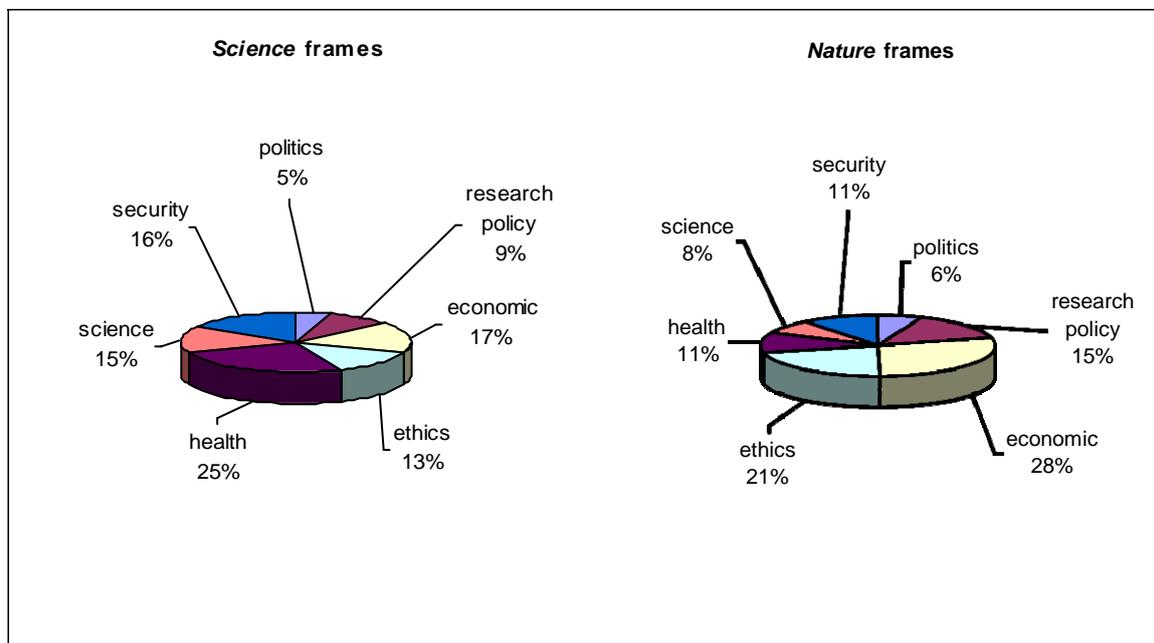


Figure 6. Distribution of narrative frames for Science and Nature

As the figures show, Science and Nature do not consider bioterrorism as being a solely scientific theme, but a topic that has strong political, economic and ethical implications.

Politics and economics make up together for 22% of the articles analysed for Science, and the percentage goes up to 34% for Nature. These figures are similar or even much higher than those found in the analysed lay press (23% in the New York Times), a fact that confirms the important role that politics and economics play today in the internal debates of the scientific community.

On Nature such changes are much more apparent: politics, economics and ethics together make up for 70% of the total, and the photographs accompanying the articles on bioterrorism show politicians as often as scientists (18% each).

Both magazines talk about governmental research funding and the need for a high level of collaboration between political and health authorities [4]. The increased focus in Nature on less scientific-sanitary implications of the bioterrorism emergency, but rather those which are political, economic and ethical, can probably be explained by the greater objectivity a European magazine can achieve regarding a threat aimed at the United States, looking more at the general consequences on the practice of science and the free circulation of ideas. The theme of preventative self-censorship is well debated in Nature: whilst in Science it is not dealt with until April, 26<sup>th</sup> 2002, the British magazine looks at the theme from November, 15<sup>th</sup> 2001, when some scientists start to gain awareness that some research findings could be considered beneficial to terrorists and could therefore be subject to restriction on the part of the United States government [5]. The scientific community asks questions about the possible effects this may have on research and how to prevent sensitive information from falling into the hands of terrorists, avoiding public accusations at the same time [6]. Between the lines in Nature the attempts of the American government to intervene in the regulation of the free circulation of scientific ideas that are considered as “sensitive homeland security information” is very clear and explicit (much more so than in Science), and a “prise de conscience” is necessary on the part of the scientists [7].

## 6. Conclusions

Aiming to analyse the debate on bioterrorism after September 11 we studied how it was mirrored in a daily newspaper, the American New York Times, and in two scientific journals, Science and Nature. With our analysis, we have shown how bioterrorism has awakened interest in both public opinion and within the scientific community.

Not surprisingly, after September 11 the number of articles on bioterrorism increased exponentially, especially in the daily newspaper. The events of September 11 were an extraordinary media watershed, and in all cases the maximum number of articles was registered after the circulation of letters containing anthrax spores in October 2001. The real unexpected fact however is the new approach scientific journals devote to this issue.

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Scientists themselves felt the weighty presence of politics in the specialist magazines, something which in April 2003 brought about a debate regarding the contamination between science and politics in the British Medical Journal as a result of questions regarding communication featured in medical journals [8],[9],[10],[11],[12].

In the New York Times, a great deal of space was dedicated to relating the details of the news stories, even though there are comments and editorials that aim to deal with the problem of bioterrorism from all points of view. Both for the dailies and the science magazines, bioterrorism is not just a topic regarding science or health, but it also has multiple social and economic implications connected to security and a reflection on the practice and communication of science. Scientists being called on to give suggestions to politicians, the Ministry producing guidelines for doctors, the controversy over the patent for Cipro, the discussions regarding the scarcity of investment in the production of vaccines are all examples of how today science is heavily contaminated by the requests that society makes of it [13].

One of the most crucial points of analysis was the crisis in communication between scientists, which brought about the scientific community's decision to practice preventative self-censorship when publishing results in the field of biomedicine, unthinkable before September 11 [14].

Up until February 2003, the date of the Denver Declaration, reflections on the free circulation of research findings follow one after the other in the two science magazines (in Nature in particular) [5],[15],[16],[17].

In these articles, scientists voice their concerns over governmental pressure on the possible use of scientific work on the part of terrorist groups and they look for a solution to safeguard the autonomy of scientific magazines [5],[6],[7],[18],[19].

Before 2003, according to Ronald Atlas, the American Society for Microbiology refused only two articles, then published after some modifications: it is clear that the fear of external interference, and not a real need of censorship, was one of the most significant stimuli for those promoting self-censorship. Moreover, the fact that the debate continued after February 2003 is certainly an indicator of a new awareness on the part of the scientists, who want to keep communicative methods under their own control [17],[20],[21].

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