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Science popularization between crisis and opportunity

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Summary. — In the last few years, extraordinarily many people have been participating in the generation of large amounts of information, spread through the Web. Such a new way of communication has undermined traditional media, *i.e.* newspapers, radio and television: which, although continuing to maintain a net lead as news providers, find themselves into objective difficulties because of the changes introduced by the new instruments and by the concomitant economic slump. The media crisis is actually the same faced by any entity well tested and reluctant to follow changes developing in a rapidly evolving context. Media find themselves in the situation of species perfectly adapted to their own environment, when that environment changes. It is early to understand whether the media fate will be similar to the Tyrannosaurs extinction, or more likely will follow the path of the dinosaurs that were the birds ancestor evolving into new more dynamical and dominant species. For the time being what happens in the communications world is that new niches, and new opportunities, open up for those interested, and the first to take advantage are, naturally, the scientists.

PACS 01.20.+x – Communication forms and techniques (written, oral, electronic, etc.).
PACS 01.75.+m – Science and society.

1. – Information in the tunnel

In the last few years the news of closure of magazines and newspapers follow each other as a war bullettin. Valiant fighters fall, like the *Boston Globe*, which on various accounts has been losing, for a while, about one million dollars per week. Even the *New York Times* is heading for trouble and, according to rumors, a great anchorman like Larry King was induced to retire not so much because of age but by his declining audience. In Italy the major papers regretfully feel the need to reduce the personnel. The problems of the newsman profession concern, of course, also the scientific journalism.

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According to data learnt at the 6th *World Conference of Science Journalists*, in London 2009, among 2000 members of the American association of scientific journalists only 79 were full time employees of a media. This declining number is no doubt related to that of the science sections of the American journals and magazines, down to 24 in 2005 from 95 in 1989.

Science sections are not perfect and are often not seen favorably because Science is part of the daily life and, therefore, it is argued that they should rather be found together with the other news, while to confine it into specialized pages might isolate it into a corner visited by readers already interested in the subjects. Personally, I do not fully embrace these concerns. Rare cases aside, like the opening of the runs of LHC or the news of the cloning of Dolly, Science as a slow and gradual process rarely fits for breaking news, *i.e.* endowed with the kind of immediacy proper of the daily events. The effort to make scientific research "fit" as much as a homicide or a stock market event forces to pull various strings which can partially be avoided through recourse to dedicated sections.

In any event although it is possible to debate about which is the most appropriate location of scientific news in the format of newspapers or a radio or television programs, the elimination of a section dedicated to Science and research under the pressure of a looming crisis is not a proper course.

And if the newspapers fire, or do not renew, their scientific correspondents who will write about the news? Under lack of specialized journalists, articles can only be written by non-specialized journalists, or alternatively it becomes more and more common to have recourse to journalists paid for each contribution and working as free lance writers. Anyhow it is often mandatory to respond quickly: and the most efficient way to prepare an article in a short time is to make use of information provided by the scientific world, through press releases or other communication material.

This is an alarming solution: a journalist's task is not just to report correctly the information received by others, rather to investigate facts, compare sources, look for additional information, in summary to be able to perform an inquiry. A cultural background and all the needed time are required for this purposes (the first is what might be missing in a non-specialized journalist, while a free lance might find serious obstacles to dedicate too much time to a single article).

The problem might appear without solution in the frame of the traditional system of creation and delivery of news to the public, but as mentioned a mutating ambient is not decidedly hostile; it only imposes creativity in finding new solutions. In the case of reports or inquiries a particularly interesting strategy is that used, for instance, by the project "*Spot.Us*" (`http://spot.us/`). Through the project site, and through others alike, it is possible to propose a theme about which a reader would like to be informed; if the theme is "adopted" by a journalist (who might be the proponent himself) all interested persons may send a token sum; if the amount is considered suitable by the author, then the article will eventually appear, free of copyright unless a magazine or newspaper decided to acquire exclusive rights underwriting a substantial percentage of the costs.

2. – Scientific communication vacant niches

Newspapers, as well as many televisions and radio broadcasts in need of preparing (correct) news and in a short time, found enthusiastic help in the scientific world. This is easily understood, since scientists have long been aware that support for research is heavily influenced by a favorable public opinion. Journalists are therefore submerged

by material coming from research institutions, associations like the American AAAS (American Association for the Advancement of Science), specialized magazines and other possible sources. It is material of the best quality, written as well of audio, video or photographic nature, from which it is very easy to extract a good article or a radio or television report. The world of Science can, as a consequence, be able to take advantage of the media weaknesses to induce them to transfer to the public a sizable portion of the news that the various sources consider important, to an extent that the magazine *Nature*, in a well-known editorial, felt the need to stress that the role of a journalist is that of a kind of "watchdog" with the task of monitoring what happens in a given sector and relaying it to the public, rather than that of a cheerleader charged to advertize its merits.

In the mean time, however, about a crucial event like the 7 TeV collisions achieved at CERN in the 2010 spring more than 800 news items were broadcast worldwide using CERN footage and more than 700 video clips published by CERN were ordered by 80 media outlets. The more efficient press offices of scientific institutions no longer distribute text-only press releases, but more or less complete video or audio information, together with the more traditional photographic and design items.

Even more impressive is the result obtained by a major institution like AAAS which, already for many years, has succeeded in influencing Science news on a world scale by sponsoring *EurekAlert* (`http://www.eurekalert.org/`). Through the latter, subscribing journalists around the world receive an ample daily selection of Science press releases. Although *EurekAlert* accepts and distributes (at a fee) articles of any scientific institution, some consider that the undoubtable prevalence of releases coming from American laboratories implies an unbalanced publicity on a world scale of their scientific achievements; with the consequent over-evaluation by (not only) the public. To enhance visibility of the European news the organization *AlphaGalileo* (`http://www.alphagalileo.org`) has been created analogous, in many respects, to *EurekAlert*.

3. – The transition from press releases to information

The media need for pre-worked material as source of their scientific news opened wide spaces to the institutional press offices charged of maintaining relations with the external world.

At the same time the impact of communication activities autonomously run by scientists is growing: in first place blogs which became important sources for both the interested public and for the journalists. A recent *Nature* poll on 500 journalists has shown that most of them had consulted a scientist's blogs as source of information.

Blogs are, however, very delicate objects to use as sources, by their very nature they tend to polarize opinions, quite alike to the editorials which, however, in a media are usually counterbalanced by articles that ideally should integrate different positions without being affected by the opinions of their writer. In my view blogs of particular interest are those whose main aim is to demistify and correct erroneous news; it is here that scientists have a chance to make use of their competence, and at the same time can assume the very useful role of "watch-dogs of the watch-dogs", with an obvious positive effect on the news and on the level of accuracy of those writing for the media.

This is the case of Phil Plait's *Bad Astronomer* (`http://blogs.discovermagazine.com/badastronomy/`), also present on Twitter, and in part of the Italian *Climalteranti*, supervised by Stefano Caserini (`http://www.climalteranti.it/`). The most brilliant example would be, in my opinion, Ben Goldacre's Bad Science

(http://www.badscience.net/) but I find it difficult to quote it as an example of communication operated by scientists because its author, formed as a medical doctor, has been working as a scientific journalist for a long time.

The new tools at the scientists' hand, like blogs and Twitter, as well as YouTube, Facebook, SecondLife, and so on, join the more traditional ones like the "Science Cafè", the meetings with the public and others.

4. – The new frontiers

The central role that science plays in the society makes it show up also in sectors outside scientific communications, which also represent an interesting opportunity and a challenge for those wanting to popularize scientific culture.

A particularly interesting case is that of fictions. Here the dominant characters used to be medical doctors: they became leading figures around the middle of last century thanks to the ease with which their profession can enter into fascinating stories, originally coupled with the interest of the American association of medical doctors for programs to improve their image to a large audience.

In the last few years, however, remarkable success has rewarded fictions in which appear microbiologists, geneticists, mathematicians and physicists. Such new fictions success (like "*Numb3rs*" or "*The Big Bang Theory*") is particularly interesting if situated into the Italian context, where notoriously fiction is an important sector of the television production. According to the Report on fiction in Italy published in 2009 by the Rosselli Foundation

- Between 2002 and 2009, 219 Italian ventures active in audiovisual production aimed at fiction (on a total of 857).
- The sector registered a turnover of 520 million Euro in 2007.
- Italy is the third fiction consumer (after Denmark and Germany).

Yet Italian fiction has small spread on the world market: we export mainly towards the East and where Italian minorities are relevant. The reason is so summarized by Oliver Kreuter (Bavaria Media) "the export deficit of the Italian products is due, in my opinion, to your products which are too much alike already viewed ones and too old".

Hence it appears that time is ripe to improve international competivity of Italian fiction. In other words, even fiction demands innovation. Is it possible to conjugate fiction innovation need with necessity of developing scientific culture?

Probably yes, given that this television format revealed itself very effective in promoting themes considered difficult. A particularly interesting example is provided by the American series *Numb3rs*. The plot is about two brothers working to solve criminal cases. The brothers are a policeman and a mathematician: the cases are always solved via arguments formulated by the mathematician. Obviously it is not a teaching tutorial, it is rather a successful entertainment program and even the Italian edition claims good audience.

Furthermore the series *Numb3rs* is suspected among the factors behind the recent increase of the enrollment in the Mathematics curricula. Its contents have also received several awards among which the *Carl Sagan Award for Public Understanding of Science* in 2006, and the *Public Service Award del National Science Board* in 2007.

The case of *Numb3rs* and of other science-based fictions shows how, while remaining in the context of large public entertainment and of commercial productions, fiction is

a powerful and effective vehicule for messages regarding matters even ones considered hard.

Even more innovative is the case of the reality proposed by the Qatar Foundation to increase the children interest for Science. In the first edition sixteen participants, from eleven Arab countries and selected among 5600 applicants, have been involved. Each had his own technological project to develop, for instance a wireless cell phone charger or solar batteries to deliver power to nomadic tents. During the five weeks of the competition they worked in groups in the laboratories of the Qatar Foundation, under the cameras. Every week a jury indicated the best projects, *i.e.* the ones selected for further development. The excluded did not leave the program, but united with the teams still in competition, because as it well known in Science collaboration makes stronger teams. The prize for the winner? 300000 dollars to invest and make the invention into a commercial product.

5. – Conclusions

At times one feels a "Judgement Day" atmosphere hovering the media, desperately confronted with the puzzle of balancing expences with the goal of finally transforming online editions into profitable ones.

Personally, nevertheless, I think that the traditional information will find its identity and the way to adapt to the new circumstances. The journalists role in communication is not easily replaced and, on the other hand, the interest of the public towards Science and scientific research is very high.

The journalist work is a full-time job requiring specific professionalism and, therefore, it is difficult that it could be trusted to those performing research work, and above all the basic characteristic of well-done communication is to depend on people not directly involved in the subject matter, *i.e.* on persons that draw a large part of their authority and credibility from not being personally involved and therefore enjoy some independence.

Furthermore journalists are experts in the art of finding hidden narrative threads, of describing characters, underlining events to build a story possessing the ideal characteristics to attract even the less attentive public, relying on curiosity, emotional make up and fun.

On the other hand, communication by scientists contains the extraordinary added value to allow entering in direct contact with the laboratories and the sites where Science develops making finally accessible to a large public a category ("scientists") sensed, until recently, as a closed one. Facing an extraordinary opportunity to establish relations with the press and the public, for scientists involved in communication the main risk is the one of self-referencing, which leads the scientific world to invest precious resources to develop products which may not correspond to the needs of those for whom they are developed. A particularly effective solution is a close collaboration between scientists and people of different formation and background, similar to what has been realized in Japan and in Germany between scientists and experts working in science museums, to set up exhibits of great impact.

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