

Gabriele Beccaria

Good morning. Let me introduce myself: my name is Gabriele Beccaria and I'm the editor of «Tuttoscienze», the weekly supplement of «La Stampa» devoted to science and technology. It's not a peer-reviewed scientific journal, but a widely read by both non-scientists and scientists as a way of keeping track of major developments in research.

Let me thank professor Zichichi, who invited me to talk to you and to this group of distinguished students and researchers. I would like to share with you some ideas and opinions in this session and then I hope you have comments and questions to share.

Before talking about science journalism I would like to emphasize some major developments now going about our major issue: science itself. May be you won't completely agree, but my goal is precisely to challenge our ideas and to see what happens.

First. Science is not what we learned at school. It's not a large and confusing collection of different disciplines, but it's changing itself in the so-called reign of complexity. Stephen Emmett, chief of European research of Microsoft, is the author of a study, called «Science 2020»: it's devoted to the major developments of sciences in the close future and it contains a revolutionary forecast. In less than two decades sciences will be completely transformed. Computer science and all the branches of sciences, from cosmology to physics, will be closely intertwined and will be connected one into each other by the power of computational and dynamic systems. Scientists will need to be completely computationally and mathematically literate and by 2020 it won't be possible to do science without this knowledge. It's the raise of what the journalist Stephen Baker called the «Numerati» (instead of digerati).

Second. Science is becoming what John Brockman called «The Third Culture»: it's bridging traditional research with humanities and both with social and cultural issues: science and society are intertwining and transforming the way we live and think. One of the best examples is the site Edge, where scientists are invited to practice a public debate about their studies and discoveries and discuss some of the great problems, from the idea of time to brain sciences, spanning a great deal of philosophical questions.

Third. Science is teaching us the power of uncertainty. Science's problems and solutions - and its theories - can never be 100 per cent sure in truth, because of the limits imposed by our human observations of the world. Physics is the perfect example: think about the harsh controversies about string theory and the search for a unifying theory or about climate change and about future scenarios.

Thomas Kuhn and Paul Feyerabend reminded us that it was the theoretical shortcomings of science to force scientists to challenge the limits of knowledge and to revolutionise the standard parameters.

As you see, scientific reporters are facing an extraordinary universe of sophisticated knowledge, of never-ending controversies, of intriguing problems. I'm talking about GM food, embryonic stem cells, nuclear energy, biofuels, evolution and neo-darwinism, alien life, genetic experiments.

Now let's cross the border and after this introduction let's talk about journalism. Last year a group of scientists at Cern - Europe's particle-physics laboratory near Geneva - celebrated the 20<sup>th</sup> anniversary of the laboratory's invention of the World Wide Web. Scientists were joined by some journalists, who may have been in a less festive mood. The Web is inflicting much pain on the media: circulations have dropped, advertising has dried up and newspapers have been forced to lay off reporters. Many science journalists are losing their jobs, and those who remain are being asked to provide content for blogs, podcasts, online videos. We are before a paradox: science journalism is threatened by the same tool which is increasing dramatically the amount of scientific information.

There is no shortage of scientific information on the Web. Research funding agencies are using Internet to inform the public about everything, from missions to Mars to pandemics. In principle, anyone with an online connection now has access to more, and better, scientific

coverage than ever before. In practice, however, this information reaches only those who seek it out. An average citizen is unlikely to search the Web for the Higgs Boson or the Proteasome, if he or she doesn't hear about it first on, say, a cable news channel or a newspaper article.

Meanwhile, scientists are blogging in increasing numbers. They not only offer expertise for free, but have emerged as an important resource for reporters. A «Nature» survey of nearly 500 science journalists shows that most have used a scientist's blog in developing story ideas.

So, if this is the situation - a difficult situation - what should we expect from scientific journalism? There are many possible answers.

First. We can think of science journalism as a kind of public-relations service, existing to explain new scientific findings.

Second. Journalism can become an «ally» of scientists, useful for shaping the public's understanding of science-related issues such as nuclear proliferation, stem cells or genetically modified crops.

Third. Journalism can be a critical partner - the equivalent of the watchdog of democracy - able to cast a fair but sceptical eye over everything happening in the sphere of science. This kind of scrutiny is very important, when we have to report about dodgy statistics and dubious claims, for example about controversial issues such as climate changes. And we have also to remind that a selected but influent group of scientists, today, is living in a «star system»: Richard Dawkins, Stephen Hawking, John Nash, Craig Venter, just to name a few, have a great deal of power. They are so assertive that is difficult to defuse any of their statements. Someone compared them to a new and very powerful sect of super-priests.

-  
Now journalism's future - and scientific journalism - is far from clear. Many people may think that science and journalism are alien cultures. Probably it's not true. As «nature» magazine wrote in one of its editorials, science and journalism are built on the same foundation: the belief that conclusions require evidence; that the evidence should be open to everyone; and that everything is subject to question.

So, a future scenario can be based on a stricter collaboration between scientists and journalists that can change the way we - as a journalists - inform and work. Meanwhile, science blogs are booming and scientists are often the protagonists. A good example is friendfeed — an online social network similar to Facebook that is popular among biologists: during scientific conferences and meetings group members post - live, in real time - brief comments sent from their laptops or mobile phones to the website: what we witness is a virtual coverage.

I think that in this ongoing process of changes journalists have a specific role and that's the mission that the AAAS - the American Association for the Advancement of Science - pointed out during its last session: bridging the gap between science and society and to promote a better understanding on how every major issue now confronting the public debate has a science and technology component.

This is a difficult dialogue. People are eager to know, but at the same time share a sceptical attitude with the scientific world. They are afraid that new technologies and discoveries - from DNA manipulation to GM organisms - can spiral out of control. Ordinary citizens have developed a much more questioning attitude towards science because of their moral and religious values: think of the cultural battle against Darwinism, for example, and the intelligent design movement. Scientists can no longer expect unconditional support from the society.

Journalists have to ease the way scientists talk to the general public and at the same time they have to challenge both public opinions and governments. Just a few politicians are interested in science. Most of them don't know science and they are driven by moral, religious and ideological attitudes which have no real links with the logic and patterns of reliable research. Among the consequences one can list the lack of funds in many countries, as in Italy.

Now, my conclusion. The slow, and often difficult, raise of scientific awareness won't solve the major global problems of the planet - they will stay here, among us for a long time - but it's unfair to think that journalism is disappearing, as it was a threatened species, a tiger or a panda.

If you talk to a reporter, he or she will say that there's a great deal of interest and involvement by public opinion: a good example is the Large Hadron Collider. Hundreds of thousands of people all over the world were willing to know about the beginning of bizarre experiments, and about even more strange realities as the Higgs Boson or the supersymmetry.

People want to know and are asking from newspapers - the «old media» - reliable information, while there's a dark side in blogs: they often polarize views rather than conveying accurate information: anti-evolution, anti-vaccine, anti-global warming are thriving in communities online. Misinformation often defeats good information.

That's why what I call «traditional journalism» can be the best response in order to collect data, organise information, explain backgrounds, predict future scenarios, in a word to answer a great deal of questions: we can use different tools - from the iPhone to iPad - and create different layouts - podcasting interviews or mailing interactive stories - but still there's always a constant goal: the need - for journalists - to find and disseminate what I call as «science stories».

A good example of «science stories» is what happened and what's happening with the famous volcano in Iceland (and don't ask its name!). Newspapers started with the hard news - the eruption and the disruption of thousands of flights - and continued with many related scientific studies. For example: the existence of a supervolcano in the Mediterranean Sea, before Sicily's coast, called «Marsili»; the possibility of using new mathematical models in order to follow the movements of the ash cloud around Europe; the latest geological studies which try to predict an eruption; other studies related to our ancient past, when, around 70,000 years ago a gigantic eruption put at risk the survival of our species of sapiens. And I could go on and on.

As you see, «science stories» are - in my opinion - like a long and fascinating chain of facts, studies, characters, and places: they are - at least potentially - a neverending sequence of stories inside other stories, back and forth, along a path that only a newspaper and a team of journalists can organize and elaborate, interacting with scientists, and transforming a single piece of news into a sophisticated collection of information.

That's the magic formula - may be - of newspapers. So my suggestion is very simple: if you want to write about science, you have to talk to scientists and to arrange long interviews and intertwine their knowledge, on one side, and the tools of investigative reporting, on the other side.

Do you remember TV serials like «CSI» or «Bones»? If many detectives - not only in fiction - changed their way of chasing killers and rapers, because of the collaboration of biologists, physicists and mathematicians, science reporters have to revolutionise the way they collect and organise information thanks to the people and researchers they write about.

Scientists are willing to talk and to explain. We, as journalists, have to challenge both them and ourselves.