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Focus

The wise and the ignorant, or a dangerous distinction for Latin America

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1.

Never have there been so much science and so much technology on so many sides as now. The expansion of scientific information in the social sphere is frankly impressive. In newspapers and movies, on television and radio, scientific ideas circulate freely every day of the week. Science is in cell phones, shampoo, compact discs, Olympic athletes' clothing, food, perfumes, and in so many places that trying to enumerate them would be insane. After all, why should it be particularly strange to speak of science and technology if scientific thought finally molds our deepest fibers? Today's society, developed or not, lives immersed in a scientific and technological culture which guides the course of the most fundamental events. Even though, of course, the common sense obliges us to admit that the majority of us are not fully conscious of its reach and consequences. Perhaps this helps to understand why we still feel a certain shame when, in a social gathering, we comment that our profession consists of spreading science or analyzing the ways in which it circulates and its repercussions in the public opinion. It may be that we live with the fear that someone will look at us strangely and with disbelief and ask us to explain what scientific communication or the social studies of science consist of or, worse yet, that we find ourselves in the embarrassing situation of rehearsing an answer to justify the importance of thinking about science in daily life.

I suspect that this fear, certainly absolutely unfounded, is connected with frustrations which are based on the unattained utopia of modern culture. This culture linked social progress to the consequence of scientific revolutions and to technologies able to overcome the flaws of the human condition. My supposition is that the failure of the ideals of modernity was also the defeat of science in its role as a social activity for communication with broad audiences distanced from scientific practice as an experience in first person. When modernity failed the walls, which the entire scientific community now tries to topple, were completely raised between science and society.

The problem is that the modernity carries in itself, paradoxically, the seed of in-communication. Even the most lucid men of the XVII and XVIII Centuries who had helped science to arrive in the parlors, streets and squares, unknowingly placed a limit, a fundamental, constitutional distinction between scientists and non-scientists. I offer an illustrative example, given that at times the interpretation of large problems is hidden in the small details which go unnoticed. In 1737 Francesco Algarotti published *Newtonianism for Women*, an essay that today we consider a classic of the popularization of science, understood according to the modern canons, not only because of its intention which the title itself denotes, but also because it was written in the form of a dialog and in vernacular language, following the tradition that was started by Galileo Galilei. But if there was indeed an explicit intention to share knowledge with and include the public in the scientific field, the audience was, inevitably, a second class citizen in the country of science: "the Sanctuary of the Temple, writes Algarotti, will always be reserved for the Priests and the favorites of the Deity; but the Entrance and its other parts will always be open to the Profane". Scientific activity consisted of a sacred experience of elevated spirits. The men of the Enlightenment were responsible for defining and spreading this distinction to the rest of society.

My hypothesis, again, is that given the fact that scientific dissemination is a creation of modernity, it has its triumphs and contradictions. In other words, in the impetus to free the spirit and emancipate reason, a system of communication with a double effect was developed: on the one hand, it drew the

public close to the field of science, but on the other hand, it rejected them. As a result, an oppressive, hierarchical and unidirectional model of the social communication of science was constructed. The distance between scientists and the rest of society is defined as a problem of education, of knowledge, of deficit. Logically, there is no science on the one hand and no culture on the other; there is science in culture. But the central problem is in our own cultural inheritance, which obligates us to constantly choose a terrible strategy of communication. The results have been deplorable. We have reinforced to the public the idea that science is a sanctuary to which only the chosen are given access, to which reverential respect is owed, and about which we can only speak in the most solemn manner. All that which diverges from the norm is at risk of being classified as anti-scientific or irrational. There, in those deep images, I find the explanation to our discomfort and to the fear that provokes in us the bothering hypothetical questions in social meetings.

2.

The consequences of using the terms "wise ones" and "ignorant ones", nonetheless, are in plain view. We have transformed the communication of science into a pedagogical act within a context of teaching-learning and, through this, the general public will always have a well to be filled with knowledge. The perception of risks is thus reduced to a problem of literacy; if the people knew more, then there would be less resistance to certain technological applications. The public information of molecular biology offers innumerable examples in which this is the argument that prevails. The usual role of public perception surveys has been that of emphasizing scientific ignorance and a certain insanity in some precautious attitudes of social groups in the face of scientific fields of development that can be considered promising. So we complain that the public perceives science poorly. But the problem may be that we perceive the public poorly. A person who shows his or her mistrust or uncertainty in light of advances in cloning cannot be readily classified as ignorant, even when this person lacks the knowledge to distinguish the differences between therapeutic and reproductive cloning. What is at play in his or her representation of the topic, what can cause him or her to feel vertigo, exceeds the comprehension of a concept or of a technique. It is expressed with other elements of his or her culture and representations of the world. Science has been advancing on territory that obligates us to question the nature of our own existence and for this reason, the answers go beyond science and its practitioners. The answers are of society's culture. Why then can we be so certain that greater scientific knowledge leads inexorably to greater support and thus to a greater social acceptance of science? More could be said of those who look doubtfully upon the possibilities that atom teletransportation opens up for the universe of quantum physics, asking if one day it will be possible for someone to disintegrate a person in one point of a city in order to materialize the person again in a different point. If indeed the intentions of the broad majority of scientists and technologists are undoubtedly good, and the effects of science and technology on society have been (who in their right mind could deny it?) in essence much more beneficial than any other thing, after all they were dreams of reason which gave birth to monsters. What do we expect society to think of the scientists and engineers at the service of the State who at this moment put into place the technological paraphernalia of the intelligent bombs that explode daily in the soil of Iraq?

It is necessary to start to combat the lack of information now, but we should recognize that this is a civic duty that exceeds scientific information. Or do we think that research into the understanding of contemporary painting or labor laws would give better results? Modern society, having abandoned the ideals of the *Uomo universale* of the Renaissance who understood everything, bases its organizational structure on the delegation of knowledge, whose flip side is the delegation of power. Trust has thus been placed in scientists and engineers and in the experts in general, to solve problems of health, hygiene, security, infrastructure, education, urbanization, environment, etc. It is the job of the experts to offer trustworthy information and to propose alternative technologies in order to guarantee social and environmental development. In this sense, it will not be the private sector that will take on this adventure. The State continues to be the guarantee that fundamental objectives are not lost from sight: better citizenship for a more just society.

This perspective makes a treatment of the scientific culture in terms of the "deficit model" fade. It seems evident that none of us interacts only cognitively with science; we do so in the "context of

feeling" and for this reason, it is relevant to speak of social representation. I consider that reducing the notion of scientific culture to the qualities of literacy deals with an interpretative nearsightedness. The defense of this type of deficit model has direct consequences for the practice of communication; it confirms a supposed "cognitive inferiority" on the part of the public, it reinforces the prejudices with respect to the capacity of the public to accede to science, and it protects the legitimacy of science as superior knowledge. Meanwhile, we lost the opportunity to analyze science in a broader and thus richer social and cultural dynamic. But, fundamentally, it marginalizes the most relevant dimension of all: the democratization of knowledge.

3.

In some academic circles in Latin American, fortunately, a certain feeling of restlessness is surfacing. This feeling shows the desire to rethink the reach of the notion of scientific culture and other concepts at hand that we habitually use, and to propose alternative models that allow questions to be asked from the point of view of our own institutional, social and political realities. We have been noticing this as we develop a common line of work on the theme between the Network of Science and Technology Indicators, Iberoamerican/Interamerican (RICYT/CYTED) and the Organization of Iberoamerican States (OEI), together with other institutions and organizations of the region.

The problem of scientific culture in the countries of Latin American cannot ignore the cruel fact that millions of people are marginalized and live and die in the most abject poverty just as it cannot ignore the fact that, in this context of extreme social debt, science and technology can be converted into future options. The historic failing of our societies can also be told from the point of view of opportunities to articulate the knowledge that is produced in laboratories with classes, factories, laws and the market which we have failed to seize. The normal condition of the development of science in the majority of Latin America countries is characterized by its weak connection with the productive structure, its inadvertent weight for political leadership, and for the tolerant but unfruitful positive valuing of a broad social majority that does not know very well what to do with the knowledge.

Basic indicators allow us to see the small quantity of money that our societies allot to finance knowledge. In this way, although not a conscious decision by the citizens, it is clear that in general terms society does not expect local science to solve its problems. The paradoxical part is that there is no viable alternative for sustained growth without one's own science and technology. The problem of the perception of science then demands a different status, and scientific culture is now revealed as a question of science within the social dynamic. Of what use is it now to insist on the wise one's halo of superiority and the characterizing of the public as ignorant and in need of instruction? The advantage of this is doubtful. And the more that we see it in this light, the more obvious it will be that the cognitive dimension is just one more aspect, relevant but only partially so. Thus the most efficient strategies of communication will be those that allow for the increase of social outcry in order to have more and better science and to develop more and better technology. And at this point we will be able to speak of a society whose culture is more or less directed toward science, technology and innovation.

4.

Scientific culture should therefore be understood as the capacity of society to incorporate scientific activity in the agenda of social themes, in that this activity is also functional with the objectives of society. Put another way, in the correct articulation which redeems the best intrinsic values of the direction of the modernity. To think of the communication of science implies being alert to the advancing of intelligent, attractive forms that excite society and permit it to be involved in the definition, the follow-up and the projection of local scientific and technological development. A scientific culture understood in these terms would imply a true process of social maturity and would be the entranceway for science to be a part of daily concerns or daily discourse. When we conceive of scientific culture as encyclopedic capacity, we considerably reduce the horizon of action, and it seems that we are not making a good analysis of science and technology in the contexts of changing industries, politics and

economies. Logically, this perspective leads us to rashly adopt a deficit model of communication that, in addition to being ideological, leads nowhere. We are losing sight of the most relevant problems to be dealt with. Before changing the mind of the public, we should change our own.

Translated by Prof. Robert Garner, IPA, Porto Alegre, Brazil.

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