Responsibility and the Role of the Press

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It has long since become a common place to say that the press plays a fundamental and irreplaceable role in communicating science to a public wider than the scientific community where it is originated. This has been specially emphasized in relation to the relentless innovation in medicine and the life sciences, considering that these are also domains of particular and widespread concern to the extent that they are perceived as affecting people's lives in more dramatic and significant ways than any other scientific field. Communicating science to the public has been the pledge of the public understanding of science movement, as it was originally called in the United Kingdom, or, later on, "*vulgarisation de la science*" (vulgarisation of science) in France, "*comunicación cientifica*" (scientific communication) in Spain and "*cultura científica*" (scientific culture) in Portugal.

However, the basic assumptions and claims of the public understanding of science have been subject to a great deal of critical scrutiny and they have evolved considerably since the mid-eighties up until now. The role of science writing, whether it is played by scientists themselves or by expert professionals of the press, has evolved as well. Among those basic assumptions and claims that have been the target of harsher criticism can be counted such concepts as: scientific literacy, as opposed to lay illiteracy and the role of the media as a mere broadcaster, translator and vehicle bridging scientific knowledge and the public sphere. Alongside the discourse of the communication of science, a parallel discourse has been developed about it that questions its value, its purpose and legitimacy. Against the linear model of the communication of science, a growing emphasis has been put on the interaction between social actors such as scientists and experts from different fields, journalists, science policy makers, managers and a variety of audiences, the boundary work in which they are involved, that has to do with the negotiation of the cognitive authoritativeness and the supposedly inherent goodness of science, and the boundary objects by means of which such boundary work is pursued, namely the media, textbooks, museums, exhibits.

Alternatively to the linear model of the public understanding of science, I subscribe the concept of mediation of knowledge that has recently been proposed in the French-speaking countries ("*médiation des savoirs*"). I wish to contend here that the failure of such model calls for the replacement of the public understanding of science by a mediation of knowledge paradigma, pledged to furthering critical awareness about both science and its communication.

In support to the basic contention of this essay, I would like to resort to the example of what I term, appropriately enough, I'm convinced, the mythology of results. The mythology of results consists basically in the following:

- representing scientific activities solely by its final products,
- subsuming scientific processes to the finalized and cumulative achievement of results;
- and isolating as results exclusively those that are evaluated *a posteriori* as application successes; which, in turn, implies:
- ignoring scientific activity as a process, or a work in progress, which *proceeds* by abiding protocolarly to *a priori* criteria of methodological rigour in research as it simultaneously *progresses* according to a non-linear, erratic and tentative course – which is to say, ignoring the revisibility inherent to all scientific knowledge as well as the historicity inherent to the pursuit of cognitive interests that vary both in time and in space, to the point of their becoming incompatible or mutually exclusive;
- annulling the role of productive error in decision making in scientific processes, in such way that succeeding in obtaining results thus becomes strictly an attribute and a necessary consequence of methodological accuracy, which implies that whatever lies beyond the scope of methodological rigorousness is taken as an irrelevant by-product of the scientific method that can be disposed of, instead of the very mark of its limits of validity;
- retrospectively identifying scientific ends with results, thus defining the first in function of the post-hoc effectiveness of the scientific enterprise, by excluding its fortuitous, unexpected, unforeseeable or adverse results, or, in more vernacular terms, the dead ends of the scientific

process, at the cost of which scientific knowledge and power always advances.

It should also be noted that each of the former features, taken *per se*, does not suffice to adequately accounting for the mythology of results. On the other hand, each of them hardly ever occurs in actuality without the concomitant or correlate presence of most of the others. Furthermore, the above characteri-zation requires additional clarification. The problem of unforeseeable, unexpected or undesirable results is expressed in the technocratic discourse of the mythology of results as a problem that stems from the insufficiency of science itself that supposedly has only gone halfway or that somehow has failed to meet its own standards of excellence or completeness. That is to say, according to this line of thought, that such a problem only arises due to the fact that the technoscientific intervention is incomplete; therefore, it's mainly a question of resuming it until it finally succeeds in accomplishing the results that were intended from the start. Unexpected results are presented as a temporary mistake, that only an occasional lack or inaccuracy of focus, scarcity of technological results or speculative misguidance can be accounted for. In sum: incompetence that momentarily interrupts the linear and cumulative progress of cognitive acquisition. There roots the deep embarrassment of scientists whenever they are confronted by what the lay public can't help but perceive as the failure of science gone astray, but that actually consists in the unpredictability and uncertainty inherent to the very enterprise of science. In order to provide a rationale for the supposed failure of science, and only when under public pressure, do scientists usually resort to improvising a tentative explanation of the ways in which science really operates, daring to show how it really is done, and not just how it produces results from a wishful, utopian standpoint. Only then scientists, but also science writers, depart from the prevailing discourse of the communication of science.

It must be emphasized that the mythology of results does not stem from the premeditated concealment by the scientist, neither does it derive from the science writer's plain falsification, nor is it an effect of an illiterate public's complacency. And, for us, it is not a matter of denouncing any of the former, nor of unmasking a kind of presumptive censorship operating negatively inside science itself or in its vulgarization by means of concealment, denial or delusion. In fact, it is certainly not untrue that science produces results; neither is it untrue that it pursues legitimate cognitive interests; nor is it untrue that the protocolar rigorousness of the scientific enterprise could be entirely, i.e., ideally, available to a lay public only inasmuch as this could become itself an expert public. In fact, this can never happen, because that's precisely what is countered by the unstoppable progress of technoscientific knowledge and power which makes it utterly impossible for human beings to go along with it. Moreover, the hyper-specialization that is caused by it splits public into fragmentary sections that turn anyone who is an expert in a given specific field a mere specialized illiterate in any other field. In this sense, it must be acknowledged that the production of illiteracy is a necessary and overall effect of the dynamics of cognitive acquisition. It is a kind of unavoidable side effect of it. However, such effect of illiteracy must not be mistaken by what I previously characterised as the mythology of results, although it sheds a light that helps us have a better understanding of it.

Like the mythology of results must not be regarded as the effect of censorship that proceeds negatively, neither should we think that what best expresses it is an astonishment effect. Such effect of astonishment is surely of no small importance to an insightful approach of the image of the scientist as a provider, of the means available to him as magic tools and to the image of the results as prodigy. In fact it is by means of the astonishment effect that is construed the image of the technoscientific fiat as the substitute for the intervention of divine providence in human history. Nonetheless, that happens only insofar as technoscience presents itself with a both a liberating and regulatory status, which the astonishment effect, per se, does not allows us to see. And what enables modern technoscience to come forward with such a double status, only its very nature can provide an explanation.

The epistemological roots of the mythology of results are to be found in the very nature of modern technoscience, as opposed to ancient Greek *tekne*. The mythology of results is akin to technoscientific supremacy of performative effectiveness over theoretical rigorousness of classical contemplative *scientia*. In more explicit terms, modern science is science because it performs, contrary to everything that science is not and that is not science. Science makes things happen, makes things be, so much so that the correlate of contemplative *scientia* was the stability of reality that it aimed to describe, whereas the correlate of modern technoscience is the plasticity of natural phenomena as shapeable objects. Modern technoscience has replaced traditional ontology by

a new onto-technology. As the matter of fact, the mythology of results indulges in a new form of naturalistic fallacy, easy to be found in the technocratic discourse. It is not anymore a matter of deriving prescriptive content from descriptive propositions in natural science discourse, or to give normative force to natural states of affairs, which was denounced by Hume as early as the eighteenth century; instead, the mythology of results implies that achieved possibilities, i.e. the altered state of affairs or the effects of technoscientific manipulation, are the ideal state of affairs, the real thing, a nature more perfect than nature itself, or the Baconian dream come true by the powers of contemporary onto-technology. In others words still, this amounts to regarding all technological possibilities as actual existents. This is in total consonance with the technological imperative, according to which not only anything is possible, but everything that is possible is therefore desirable.

Nature having thus lost its stability under the technoscientific relentless exploration of potentialities, results now appear to retrieve some kind of that lost stability, to the extent that they seem to provide reliable new facts to human need of existential security. Results appear to have a rather authoritative and prescriptive character from which technoscience tends to derive a great deal of its contemporary legitimacy. Results become authoritative as they impose themselves with the might of a fact that sweeps away what then appears to be the lightness of opinions and the vain discussibility of values. Results are prescriptive to the extent that the inarticulate – i.e. non-linguistic – effectiveness of their doing eloquently proclaims what should be done, while politics, ethics, aesthetics, and everything that technoscience is not, appear to succumb to small talk and futile guessing and pondering and end up buried under their helpless ignorance and ignorant helplessness. Technoscientific performance thus acquires a kind of emancipatory quality, for it seems to deliver humankind from ages-old afflictions, disease, famine, all kinds of hardship that burden human life. Publicly presented with both such regulatory and emancipatory qualities, technoscience aims at replacing politics and ethics in decision making processes. By exceeding itself in providing results, technoscience exorbitantly indulges in political and ethical uses, so much so as it's precisely by way of such exorbitance that technoscience offers itself as the instance of decision-making, the ultimate arbiter of political conflicts and ethical dilemmas. In this, the mythology of results equates the positivity and objectivity of results with the claim of science to be value-neutral. It is thus not difficult to understand why science – and the life sciences, as far as human and social affairs are concerned - is systematically called upon in the quality of ultimate arbiter whenever decisions are to be made. Take the well-known cases of the status of the embryo, or the status of the irreversible comatose, or simply almost all the controversies of what it means to be human. "Let's see what the life sciences have to say about it" has become the motto to most decision-making processes concerning human existence. Most insightfully, Giorgio Agamben has reminded us to what extent contemporary biopolitics has grounded the definition of the human in biological data. In fact, discussions about the human no longer take place from the standpoint of the philosophical categories of the good or decent life, as in the classical ethical and political tradition, but, instead, from the standpoint of the bio-technological manipulation of the individual as a living being. In fact, what was at stake in the classical political paradigm were the ends, or the goals, or the values of human action, as they were defined and argued by way of the public use of discourse, while in the biopolitical paradigm of Modernity it's practical results that are the substance matter, as they are achieved by the non-discoursive tools of technoscience.

It should be stressed that technoscience is in condition of providing means to the pursuit of ends, that can be achieved or not, rather then producing definite results, countering the current mythology that leaves unanswered the unavoidable question of unforeseeable, unexpected, undesirable, out-of-control results, as well as countering the brave new world of the exponential growth of technoscience which is presumed to have linear and direct emancipatory effects on the human condition. The mythology of results is also at the root of a widespread misconception about science, common among both laypersons and scientists, according to which science is self-sufficient and above the rational *polemos*. Such presumptive scientific self-evident factuality therefore appears to be a solid ground for self-regulation: it´s just a matter of extending to the professional - i.e., social - level the same kind of positive and objective rationality that allows scientific knowledge to have an insightful grasp and control over natural phenomena. Also, from this standpoint, science is bad science only insofar as the scientific community allows itself to be manipulated, which is to say, whenever scientific activities go out of peer control, whose intrinsic rationality appears to be an

adequate safeguard at both epistemological and ethical level. According to such view, scientific controversies are but a symptom of science momentarily gone wrong and it can and must be restored back to its original correctness by recovering "facts" and avoiding the - social, political, ethical, philosophical - arenas where controversies take place. In fact, according to the standpoint that usually prevails in the communication of science, scientific controversies are not portrayed as something that is intrinsic to scientific progress and to the pursuit of cognitive goals, but rather as a by-product of the incommensurability of the culture of science and other domains of rationality or culture, namely the humanities. This takes controversies to the outside of science and amounts to stating the purity of the natural sciences against the impurity and the incompleteness of the social sciences or the humanities. It's all too frequent to hear, from scientists, that there's no compelling reason for science to even accept engaging in discussions with what is not science, let alone be challenged by it. All fields of knowledge outside the natural sciences in turn, tend to be disregarded as irrelevant non-science or fake science, and as an impertinent interference with which real science may only comply insofar as it plays the paternalistic role of pedagogic correction, i.e., of purveying literacy.

Furthermore, the mythology of results may as well be regarded as a form of the illusion of control of the technoscientific thrust and dynamics from which we no longer can detach ourselves in the technological age. In this sense, the mythology of results is a rationalization that aims at retrieving some kind of human shape in the technoscientific thrust that has long gone far beyond the human scale. In fact, the mythology of results signifies an aesthetic evaluation of technoscience, precisely the kind of evaluation that is more readily accessible and understandable to laypersons - and in these has to be included anyone who, although knowledgeable in one field of expertise, would be illiterate in another one – who are far more capable of understanding scientific performativity by its results, as they are perceived through the filter of human needs and expectations, rather than by the process of obtaining those results. In short, humans are far more able to deal - preferably discoursively, but also non-discoursively - with results that are perceived as positive for their daily lives than with the technoscientific process that either does not respond to or is beyond the reach of the human words that we use to relate to each other in everyday life.

In sum, a critical approach of the mythology of results, as shown above, provides a good example of what can be a model of mediation of knowledge, alternative to the linear model of public understanding of science. The mediation of knowledge model is one that exposes both the basic dichotomy between literacy and iliteracy that grounds the linear model and the basic equation between scientific rationality and the inherent goodness of science that supports that model. In doing so, the mediation of knowledge model challenges the cognitive and the normative authoritativeness of science and matches the demands of responsibility which apply primarily, but not only, to the press, since such demands extend necessarily to all individuals or organizations that engage in discerning, for a wider public, what technoscience is all about.

KEYWORDS Technoscience. Mediation of Knowledge. Biopolitics

ABSTRACT The press plays a fundamental role in communicating science to the public. However, the linear model of public communication of science has been the target of considerable criticism and is in the process of being replaced by an alternative model of mediation of knowledge. It is pledged to futhering critical awareness about the boundary work in which the cognitive and the ethical authoritativeness of science is the object of negotiation between scientists from different fields, policy makers and other social actors. The mythology of breakthroughs in the communication of biomedical technosciences provides relevant examples of such a boundary work and the need of an alternative model of mediation of knowledge. According to the former, science writing has a fundamental ethical responsibility towards asserting that biomedical technoscience is capable of providing means to an end, rather than guaranteeing predetermined positive results.

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