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Another Science is Possible

A Manifesto for Slow Science

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Towards a Public Intelligence of the Sciences

Should 'the public' 'understand' the sciences?

Our Anglophone friends speak of the 'public understanding of science'.[1] But what is meant by 'understand' here? Many people think each citizen should have the basic 'scientific equipment' (or literacy) necessary to understand the world we live in, and especially to accept the legitimacy of the transformations of the world that the sciences bring about. In fact, when the public begins to resist an innovation that scientists have backed, as notably in the case of GMOs, the usual diagnosis points to the lack of such understanding. Thus, the public apparently fails to understand that the genetic modification of plants is not 'essentially' different from what farmers have been doing for millennia, but is just faster and more effective. Others say that the methods that make for 'scientificity' have to be understood first, and that the public supposedly mixes up 'facts' and 'values' because it doesn't understand that scientists are free not

to ask certain questions. Of course, it is not a matter of denying citizens the right to accept or reject an innovation, but they should do so only on the basis of solid reasons, and not confuse scientific facts with their own convictions or values. The need for an apprenticeship in the sciences, it is argued, is founded on the fact that close observation, the formulation of hypotheses and their verification or refutation, form the basis not only for the construction of scientific knowledge but for all rational procedures. The sciences are therefore a model that every citizen should follow in their daily lives.

Such arguments are used today to justify a veritable 'order word'[2] coming from public authorities when faced with a somewhat suspicious citizenry. If the latter are sceptical about the benefits the sciences bring to society, the response will be: 'The public and its science have to understand each other.' The possessive 'its' implies what standard science lessons in school try to get across: scientific reasoning belongs by right to all, in the sense that, confronted with the same 'facts' as Galileo or Maxwell, each of us could have drawn the same conclusions.

Of course, anyone with even a minimal exposure to the history of science, or to the sciences themselves 'as they are made', can easily conclude that the anonymous rational being drawing these 'same conclusions' is just the correlate of the 'rational reconstruction' of the situation, from which any reason for hesitation has been purged, and where the facts literally 'shout out' the conclusion they lead to with all the authority one could wish for.

In any event, laboratory conditions, reconstructed or not, have very little to do with those situations we are

confronted with as citizens. For the latter, I would use Bruno Latour's felicitous phrase, 'matters of concern', which, in opposition to what are presented as 'matters of fact', insists that we think, hesitate, imagine and take sides. 'Concern' happily incorporates the notions of preoccupation and choice, but also the idea that there are situations that concern us before they become objects of preoccupation or choice, situations which, in order to be appropriately characterised, demand that 'we feel concerned'. We should not talk about these situations being 'politicised', as too many scientists complain. They are a long way from being occasions for the more or less arbitrary or contingent expression of political engagement; rather, what they require is the power to make people think about what concerns them, and to refuse any appeal to '*matters of fact*' that would bring about a consensus. If there is a question to be asked, then, it is first of all how such situations have so often come to be separated from this very same power, which they require.

To return to GMOs, they constitute a quite different 'matter of concern' from laboratory GMOs defined in terms of the preoccupations of biologists working away in well-monitored spaces. GMOs cultivated across thousands of hectares raise questions to do with genetic transfer and pesticide-resistant insects, questions that can't be raised at the level of the laboratory, not to mention issues such as patent applications for modified plants, the reduction (already critical) of biodiversity, or the runaway use of pesticides and fertilizer.

The essential thing with 'matters of concern' is to get rid of the idea that there is a single 'right answer' and instead to put what are often difficult choices on

the table, necessitating a process of hesitation, concentration and attentive scrutiny – and this despite the complaints of the entrepreneurs, for whom time is money and who demand that everything that is not prohibited be allowed. Then there is the propaganda, often in conjunction with scientific expertise, that all too frequently presents an innovation as 'the' correct solution 'in the name of science'. This is why I would propose, in place of the notion of understanding, a 'public intelligence' [*intelligence publique*] of the sciences, involving the creation of intelligent relationships not just with scientific outcomes, but with scientists themselves.

What should the public understand?

When we speak of public intelligence, we have to emphasise first of all that it is not a matter of activists denouncing, as enemy number one, those biologists who have presented GMOs as 'the' rational and objective solution to the problem of world hunger. Rather, if a public intelligence is necessary, it essentially has to do with the very fact that those scientists were able to take this kind of position without a care in the world. If we put to one side hypotheses about dishonesty or conflicts of interest, then the question becomes one of understanding how the training and practice of researchers can lead to such arrogant and naive forms of communication, completely devoid of the critical thinking they so often boast about. How can one explain also the failure of the scientific community to publicly express outrage over this abuse of authority?

Quite the opposite occurred, it seems. Consider this extract from the summary report for the *États généraux*

de la recherche held in 2004, in which researchers told the public what they should be understanding:

> Citizens expect solutions from science for all sorts of social problems: unemployment, depleted oil reserves, pollution, cancer . . . the path that leads to the answers to these questions is not as direct as a programmatic vision of research would have us believe . . . Science can only function by dealing with its own problems in its own way, shielded from urgency and from the distortions inherent in economic and social contingencies.[3]

This quotation comes from a collective report, not the wild imagination of some individual. Its authors not only attribute to citizens the belief that science can solve problems like unemployment, they too seem to agree with this belief. Apparently, science can solve problems like this, but only if it is allowed the freedom to formulate its own questions, shielded from the 'distortions' said to be 'inherent' in 'contingent' economic and social preoccupations. In other words, authentic scientific solutions transcend such contingencies, and thus can ignore them (just as those biologists cheerleading for GMOs have ignored the economic and social dimensions of world hunger).

In short, what I have dubbed 'matters of concern' are characterised as 'distortions' in this account, while the solution that 'science' comes up with is identified as an answer to a problem that has at last been well-formulated. It follows that citizens are right to be trusting, but they have to know how to wait, and understand that scientists owe it to themselves to remain deaf to any noisy or anxious demands.

In fact, in 2004, the researchers did not address

citizens, but went over their heads to the public authorities in charge of the politics of science, on the occasion of its redefinition in the terms of the 'knowledge economy'. In their complaint they took up the hackneyed theme of the goose that lays the golden egg – stand back, keep it well fed, and don't ask difficult questions, otherwise you will kill it and there will be no more eggs. Of course, it is not the business of the goose to wonder for whom her eggs are golden, and the generally beneficial character of scientific progress is taken for granted. The small question as to why this progress may today be associated with 'unsustainable development' is not asked.

I don't think that scientists are 'naive', like the goose whose egg we remove from under it in order to give it a new value for the sake of humankind. They know perfectly well how to attract the interest of those capable of turning their results into gold. But they also know that the knowledge economy marks the end of the compromise that guaranteed them a minimum of vital independence. They can't, however, talk about that openly, because they fear that if the public were to become aware of the ways in which science 'is made', they would lose confidence and reduce scientific proposals to simple expressions of particular interests. 'People' must continue to believe in the fable of 'free' research, driven by curiosity alone towards the discovery of the mysteries of the world (the kind of candy that helps so many well-meaning scientists to set about seducing childish souls).

In short, scientists have good reason to be uneasy, but they can't say so. They can no more denounce those who feed them than parents can argue in front of their children. Nothing should upset the confident

belief in Science, nor should 'people' be urged to get involved in questions they are not, in any case, capable of understanding.

Sciences need connoisseurs

If public intelligence on scientific questions has any meaning, it is in relation to this type of systematic distancing. Scientific institutions, the State and industry all find their interests converging here. But we should not be naive about this either. We should not set up, in opposition to an infantile public in need of comfort, the figure of a thoughtful, reliable public capable of participating in the things that concern it. One initial way of not being naive is to remind oneself over and over, as the physicist Jean-Marc Lévy-Leblond has constantly done, that the question of being capable or not is equally relevant to scientists themselves. When he wrote 'If scientism and irrationalism, traditional foes, are still going strong, it is because uncultivated science turns as easily into the cult of science as into occult science',[4] he was not just talking about the public, but also, perhaps above all, about scientists themselves. In other words, a public intelligence of science would involve an intelligent and lucid relationship to scientific claims, an intelligence that would concern the scientists as much as the 'people', since they are all vulnerable to the same temptation.

We know that what Lévy-Leblond calls scientific culture is not to be confused with some general scientific literacy – knowing 'something' about physical laws, atoms, DNA, etc. A cultivated science should produce not only specialists but also connoisseurs, as is the case

way that uncultivated science can easily turn into occult science or into the cult of science, an indifferent confidence can tip towards mistrust or hostility. This is all the more likely to the extent that more organic links between research and private interests are being forged. Henceforth, those scientists who fight to conserve some basic autonomy will not be able to limit themselves to an appeal to 'save research'. They will have to have the courage to say what it is that research needs to be saved from; they will have to go public on the ways in which they are urged or compelled to become simple providers of industrial opportunities. And they will need a public intelligence that is inclined to hear them.

But the scientists will also have to know how to earn the support that they need, which will not be the case unless they are capable of hearing and taking seriously those questions and objections which today they too often dismiss as opinions that 'don't understand the science'. From this point of view, it seems to me disappointing and unsettling that agronomists, field biologists, specialists in population genetics and others, who were at first excluded from the commissions dealing with GMOs and their associated risks, did not loudly and clearly acknowledge their debt to those whose efforts had secured them some kind of a hearing in the first place – that is, those adversarial groups who were able to persuade the public authorities to adopt a slightly more lucid position on the GMO question, and who brought them more generally out into the political, social and scientific culture.

Here the scientific ethos itself is at stake, and in particular scientists' mistrust of everything that runs the risk of 'mixing up' what they consider to be 'facts' and

values'. This deeply embedded mistrust is quite different from a simple ignorance that might be remedied by courses on epistemology or the history of science. My teaching experience tells me that most students enrolled in the so-called 'hard sciences' make up their minds to forget such courses once they've got through the exams. No surprises there, because by signing up for a 'hard science' degree they have made a choice that is not initially motivated by 'curiosity' – or the 'desire to uncover the mysteries of the universe' (most students arriving with this in mind quickly realise their mistake) – but by the image of the sciences promoted by the education system. They have learned that the sciences allow problems to be 'well-posed' and therefore amenable to being given the 'right solutions'. And those solutions will be beyond dispute, verifiable by anyone, thereby silencing those chatterers who mix everything up. However partial and deceitful this image may be, it has the power to attract and select. Those who opt to take scientific studies might be inclined to tolerate courses they consider 'mere talk', but they will not see them as a crucial part of their training – and many of their 'real' teachers will not fail to reinforce this prejudice with their shrugs, ironic smiles and wise counsel on the importance of not 'spreading oneself too thinly'. Of course, any scientist worthy of the name will be ready to swear allegiance to epistemological principles concerning the limits of knowledge and its conditions of validity, but only in a formal way, because these principles will be forgotten the moment a situation arises in which their knowledge appears to be offering the 'correct', ultimately 'rational' solution to some question that has exercised the chatterers. Clearly, this ethos implies that scientists refuse to

allow their own type of knowledge to be made part of the general culture: in their view amateurs are just chatterers who descend on these correct solutions and drag them into a world of idle gossip.

While it may be pointless to hope that courses on epistemology or the history of science could transform this situation, an experiment carried out over three years at the university in Brussels gave me a glimpse of another possibility.[5] A framework was set up within which science students were confronted with socio-technico-scientific controversies, but they were given sole responsibility for exploring the issues via the resources on the internet, and hence for discovering, in their own way and with no predetermined method, the clashing arguments, the partial and partisan truths, as well as the huge range of facts involved. Unlike other frameworks for the 'investigation of controversies' (in particular that of Bruno Latour with his students at Sciences Po in Paris), it was not a case of taking part in the construction of a new kind of expertise. The framework applied to any student, and its ambition went no further than that of complicating their 'thought habits'.

It became apparent that the students were interested in finding things out 'in the field', that is, on the Web: a field constituted by a variety of situations marked by uncertainty and by the entanglement of what they had assumed would be separable into 'facts' and 'values'. They had been in the habit of relegating to 'ethics' (no one speaks of politics any more) everything that didn't seem to bow down before the authority of the 'facts'. They discovered that there are many conflicting types of 'facts', and that each of them was linked, for those presenting them, to what appeared to be important in

the situation. But they didn't draw sceptical or relativist conclusions from this discovery, because they realised that it was the situation itself (as a 'matter of concern') which imposed this conflictual entanglement that prohibited one order of importance (for example, that of proof) from dominating all the others. What indeed surprised them was the casual way in which scientists allow themselves to pooh-pooh as 'non-scientific' or 'ideological' things that others think are important.

I wouldn't say that these students were inoculated once and for all against the scientific rationality/mere opinion opposition, but I was impressed by the fact that, far from being plunged into chaos, confusion and doubt, at least some of them seemed to experience a feeling of liberation. It was as if they had discovered with relief that they didn't have to choose between facts and values, between their scientific loyalty and (the remains of) their social conscience, because it was the situation itself that required them to identify the relevance of a knowledge and to understand its selective character – what it makes important, what it neglects. It was as if this curiosity so often associated with science was being called upon and nourished for the first time.

Experiments like the one I have just described are obviously not sufficient, but they are perhaps necessary to weaken the hold of the slogans reproduced in such a remarkable way in the 2004 warning from the French research body. It seems that curiosity, much more than the critical reflexivity close to the hearts of epistemologists, is what needs to be nourished and freed from judgements about what does and doesn't count. Perhaps this curiosity could bring together students from different fields, allowing them to work together, collectively